OWNER'S MANUAL

OM-1593 176 877T

Use above FORM number when ordering extra manuals.

2007−08

ICE-12C, ICE-25C, ICE-25CX, ICE-27C, ICE-27T ICE-40C, ICE-50C, ICE-50CM, ICE-55C, ICE-55CM, ICE-80C, ICE-80CM, ICE-80CX, ICE-80CXM, ICE-80T, ICE-80TM, ICE-100T, And ICE-100TM Torches

1. Specifications

Air-cooled torches for plasma arc cutting (PAC)
12 A model: 12 A at 35% duty cycle; 25 A model: 25 A at 35% duty cycle; 27 A model: 27 A at 35% duty cycle; 40 A model: 40 A at 50% duty cycle; 50 A models: 50 A at 60% duty cycle; 55 A model: 55 A at 60% duty cycle; 80 A model: 80 A at 50% duty cycle 100 A model: 100 A at 80% duty cycle
12 A model equipped with 20 ft (6.1 m) cable 25 A model equipped with 15 ft (4.6 m) cable; available with optional 25 ft (7.6 m) cable 27 A model equipped with 20 ft (6.1 m) cable; 40 A model equipped with 25 ft (7.6m) cable; available with optional 50 ft (15.2 m) cable 50 A model equipped with 25 ft (7.6 m) cable; available with optional 50 ft (15.2 m) cable 55 A model equipped with 25 ft (7.6 m) cable; available with optional 50 ft (15.2 m) cable 80 A model equipped with 25 ft (7.6 m) cable; available with optional 50 ft (15.2 m) cable 100 A model equipped with 25 ft (7.6 m) cable; available with optional 50 ft (15.2 m) cable
Use air or nitrogen plasma gas: 12 A model: 1 CFM (28.3 L/min) at 40 PSI (276 kPa); 25 A model: 4.5 CFM (129 L/min) at 60 PSI (414 kPa); 27 A model : 4.5 CFM (129 L/min) at 60 PSI (414 kPa); 40 A model: 6 CFM (170 L/min) at 75 PSI (517 kPa); 50 A model: 5.3 CFM (152 L/min) at 70 PSI (482 kPa); 55 A model: 6 CFM (172 L/min) at 70 PSI (482 kPa); 80 A (C, CM, CX, and CXM) model: 7.2 CFM (207 L/min) at 80 PSI (551 kPa) 80 A (T and TM) model: 7.8 CFM (221 L/min) at 70 PSI (482 kPa) 100 A model: 9.2 CFM (260 L/min) at 75 PSI (517 kPa)
Safety interlock devices shut down power source
12 A, 27 A, 40 A, 50 A, 55 A, 80 A and 100 A models have safety trigger guard
Gear rack pitch for 50 A, 55 A, 80 A and 100A machine-held models: 32
Cutting capacity for mild steel: 12 A model − up to 3/16 in (5 mm) at 12 A; 25 A model − up to 3/8 in (10 mm) at 25 A; 27 A model − up to 3/8 in (10 mm) at 27 A; 40 A model − up to 1/2 in (12.7 mm) at 40 A; 50 A model − up to 7/8 in (22 mm) at 50 A; 55 A model - up to 1 in (25.4 mm) at 55 A; 80 A model − up to 1-1/4 in (32 mm) at 80 A 100 A model − up to 1-1/2 in (38 mm) at 100 A

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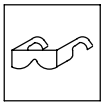
2. Safety Symbol Definitions

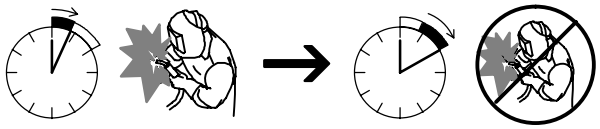
	DANGER! − Indicates a hazardous situation which, if not avoided, will result in death or serious injury. The possible hazards are shown in the adjoining symbols or explained in the text.		Wear safety glasses with side shields.
	Indicates a hazardous situation which, if not avoided, could result in death or serious injury**.** The possible hazards are shown in the adjoining symbols or explained in the text.		Cutting processes cause flying pieces of metal and sparks. Wear a face shield.
NOTICE	Indicates statements not related to personal injury. Indicates special instructions.		Static electricity can damage parts on circuit boards. Put on grounded wrist strap before touching circuit board.
	Beware of electric shock from the cutting torch or wiring. Touching the cutting torch while in contact with the work or ground can cause electric shock. Always wear dry gloves. Keep all panels and covers closed.		Have only trained and qualified persons install, operate, or service this unit. Call your distributor if you do not understand the directions. For CUTTING SAFETY and EMF information, read power source Manual.
	Cutting sparks can cause fire or explosion. Move flammables away. Do not cut on closed tanks or barrels − they can explode. Clean tanks or barrels properly.		Beware of moving parts. Keep guards and panels in place, covers closed, and hands away from moving parts.
	Arc rays can burn eyes and skin − wear face protection (helmet or face shield) with correct shade of filter, and cover exposed skin with nonflammable clothing.		Breathing cutting fumes and gases can harm your health. Cutting requires good ventilation. If ventilation is impossible, such as when cutting in a confined space, use an air-supplied respirator.
	Hot parts can cause burns. Cutting makes parts very hot − let them cool before touching.		The plasma arc can cause injury. The intense heat of the arc or pilot arc can cause serious burns. Keep away from the torch tip when the trigger is pressed. Do not grip material near the cutting path.
	Allow cooling period. Reduce current or reduce duty cycle before starting to cut again. Follow rated duty cycle.		Prolonged noise from some cutting applications can damage hearing. Use approved ear plugs or ear muffs if noise level is high.

3. Duty Cycle And Overheating

Duty Cycle is percentage of 10 minutes that unit can cut at rated load without overheating.

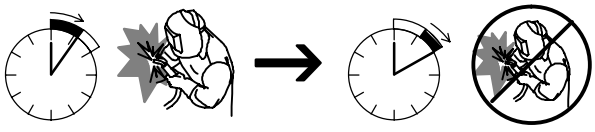
NOTICE − *Exceeding duty cycle can damage power source and torch and void warranty.*

12 Ampere Torch: 35% Duty Cycle At 12 Amperes
25 Ampere Torch: 35% Duty Cycle At 25 Amperes
27 Ampere Torch: 35% Duty Cycle At 27 Amperes



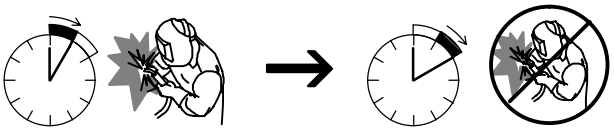
3-1/2 Minutes Cutting — 6-1/2 Minutes Resting

50 Ampere Torch: 60% Duty Cycle At 50 Amperes
55 Ampere Torch: 60% Duty Cycle At 55 Amperes



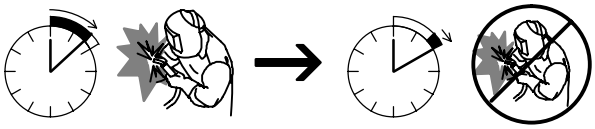
6 Minutes Cutting — 4 Minutes Resting

40 Ampere Torch: 50% Duty Cycle At 40 Amperes
80 Ampere Torch: 50% Duty Cycle At 80 Amperes



5 Minutes Cutting — 5 Minutes Resting

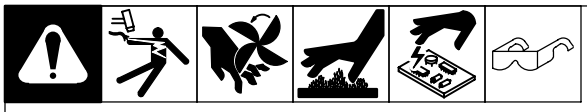
100 Ampere Torch: 80% Duty Cycle At 100 Amperes

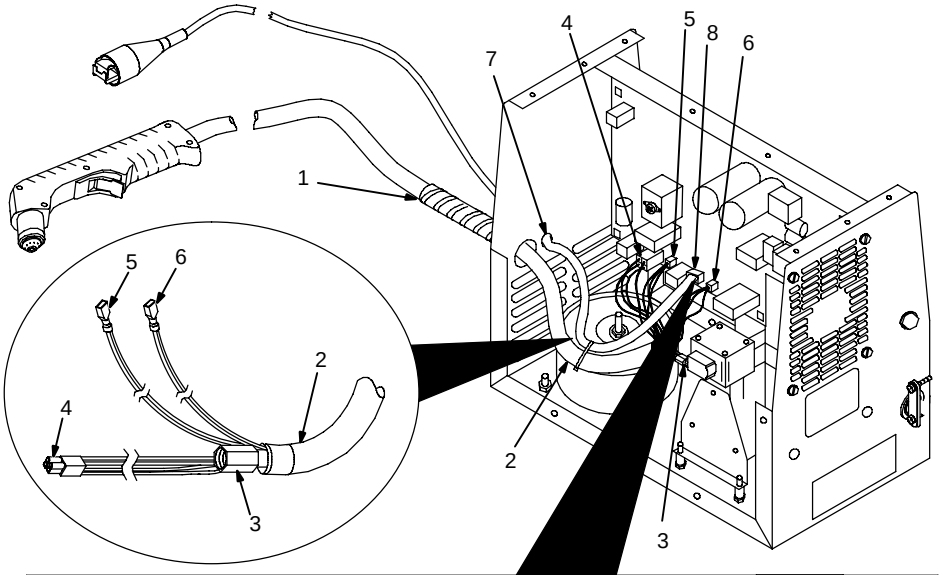


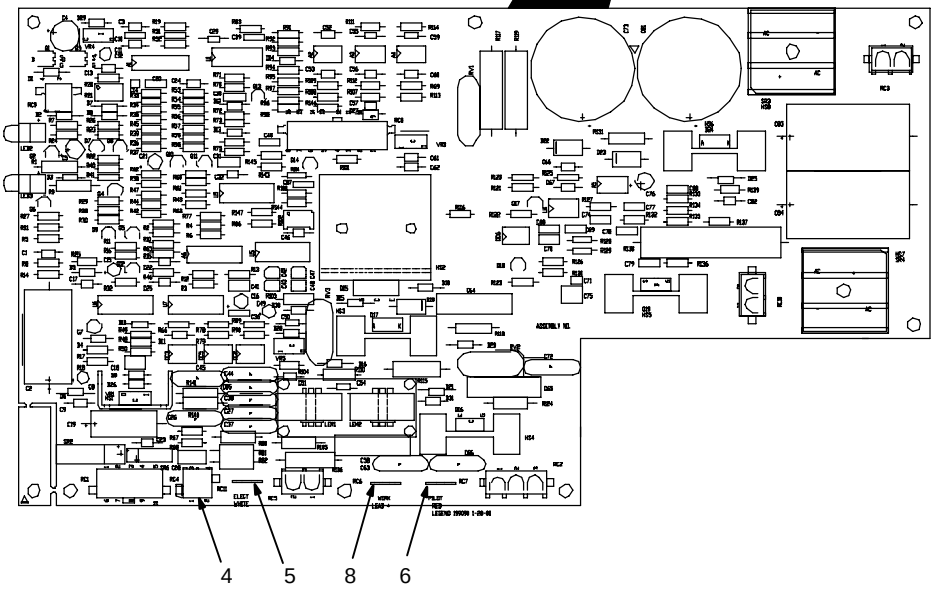
8 Minutes Welding — 2 Minutes Resting

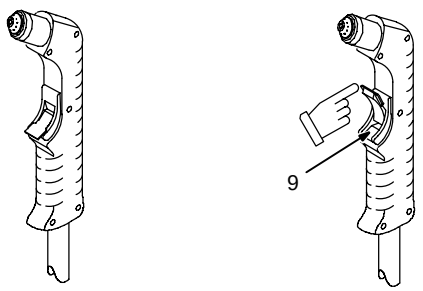
rduty1* 5/95

4. Installing 12 Ampere Torch And Work Cable, And Using Trigger Safety Lock









Trigger Locked

Trigger Unlocked

Tools Needed:

5/8 in

If torch or work cable needs to be removed or replaced, proceed as follows:

⚠ **Turn power Off, and disconnect input power plug from receptacle.**

Remove wrapper from unit.

Torch Connections

Remove existing torch cable from unit.

1 Strain Relief

2 Torch Cable

Insert cable through strain relief. Slide strain relief nut onto torch cable, but do not tighten.

3 Air Line Connector

Install air line connector onto compressor fitting.

4 Plug PLG4/Receptacle RC4

Connect PLG4 to receptacle RC4 on circuit board PC1.

5 Female And Male Friction Terminal RC11/ELECT WHITE

Connect female friction terminal on end of white leads to RC11/ELECT WHITE.

6 Female And Male Friction Terminal RC7/PILOT RED

Connect female friction terminal on end red leads to RC7/PILOT RED.

Tighten strain relief nut.

Tighten strain relief around cable.

Work Cable Connections

Remove existing work cable from unit.

7 Strain Relief

☞ *Be sure to allow some work cable slack inside the unit.*

Insert work clamp lead through strain relief, and install strain relief into front panel.

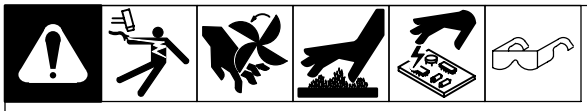
8 Work Lead Male Friction Terminal

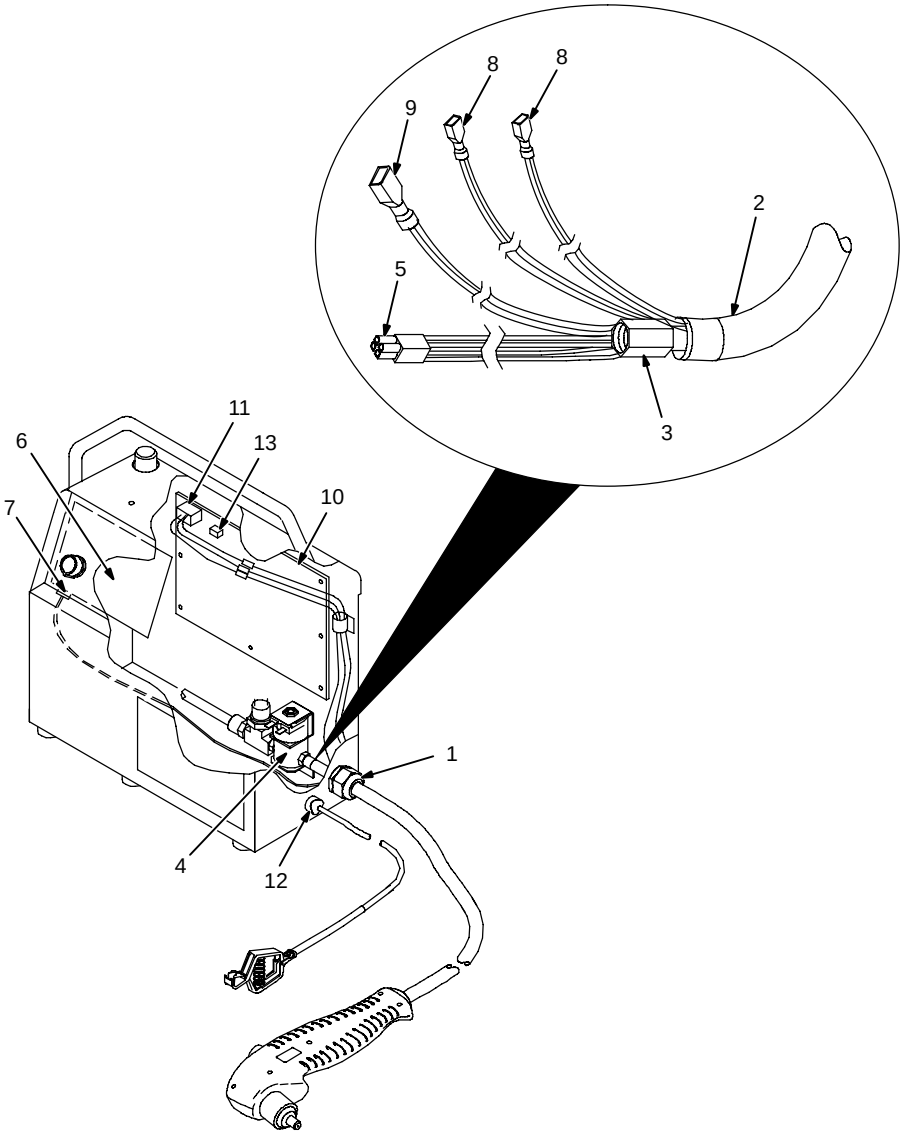
Connect work clamp lead to male friction terminal labeled WORK LEAD on circuit board PC1. Route lead along torch lead bundle.

9 Trigger

Ref. 801 300-B / Ref. 802 464 / 199 088 / 801 545-A

5. Installing 25 Ampere Torch And Work Cable





Turn Off power source, and disconnect input power plug from receptacle before installing torch and work cable.

Remove top and screws holding front panel in place. Without disconnecting any plugs, move front panel to allow access.

Torch Connections

1 Strain Relief Clamp

2 Torch Cable

Insert cable through strain relief clamp.

3 Gas Connector

4 Gas Valve

Install gas connector onto gas valve.

5 Plug PLG18

6 Safety Control Board PC2

7 Receptacle RC18

Connect PLG18 to RC18. Route leads along existing lead bundle.

8 Female Friction Terminals

9 Male Friction Terminal

10 Power Control Board PC1

11 Receptacle RC4

Connect female terminals to leads 23 and 24 from RC4 (connect to either lead). Connect male terminal to lead 25 from RC4. Route leads as shown.

Work Cable Connections

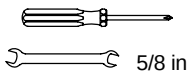
12 Strain Relief Clamp

Insert work clamp lead through strain relief clamp.

13 Receptacle RC6

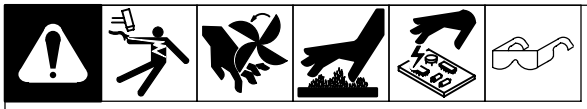
Connect work clamp lead to lead 20 from RC6 (leads not shown). Route leads along existing lead bundle.

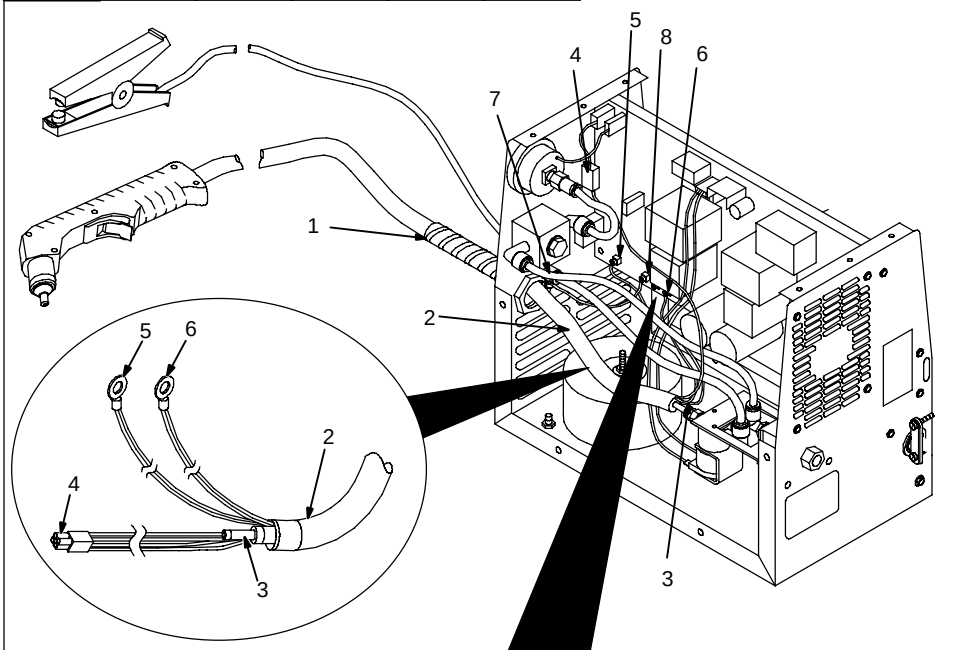
Tools Needed:

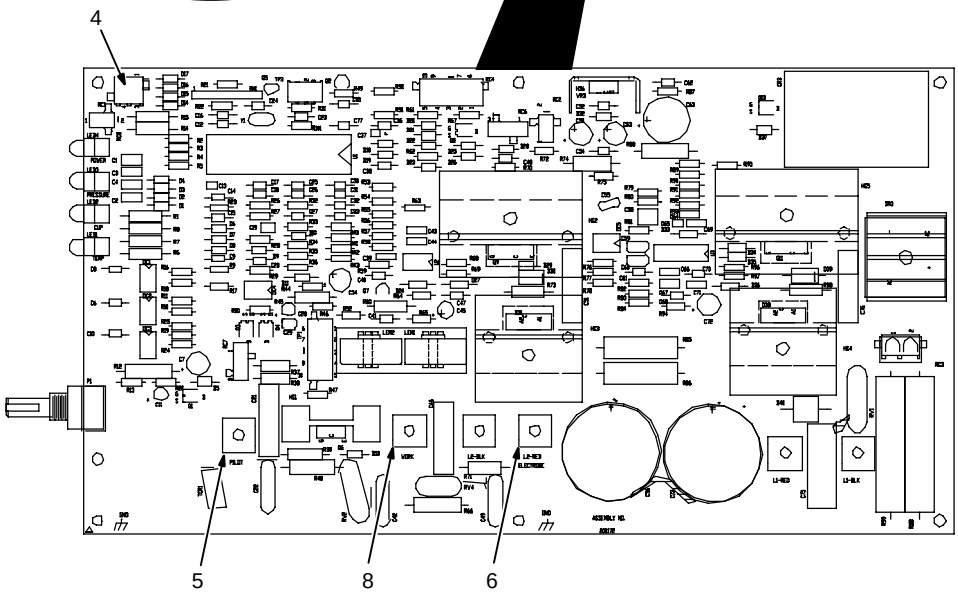


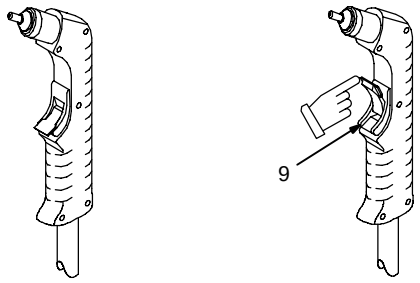
801 423 / Ref. 801 300-B

6. Installing 27 Ampere (ICE-27C) Torch And Work Cable, And Using Trigger Safety Lock









Trigger Locked

Trigger Unlocked

If torch or work cable needs to be removed or replaced, proceed as follows:

Turn power Off, and disconnect input power plug from receptacle.

Remove wrapper from unit.

Torch Connections

Remove existing torch cable from unit.

1 Strain Relief

2 Torch Cable

Insert cable through strain relief. Slide strain relief nut onto torch cable, but do not tighten.

3 Air Line Connector

Insert air line connector into solenoid fitting.

4 Plug PLG1/Receptacle RC1

Connect PLG1 from torch to receptacle RC1 on end of wiring harness connected to circuit board PC1.

5 Ring Terminal And Terminal PILOT

Connect ring terminal on end of red leads to PILOT terminal.

6 Ring Terminal And Terminal L2−RED

Connect ring terminal on end of white leads to L2−RED terminal.

Tighten strain relief nut.

Tighten strain relief around cable.

Work Cable Connections

Remove existing work cable from unit.

7 Strain Relief

☞ *Be sure to allow some work cable slack inside the unit.*

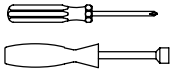
Insert work clamp lead through strain relief, and install strain relief into front panel.

8 Work Lead Ring Terminal

Connect ring terminal on end of work clamp lead to terminal labeled WORK on circuit board PC1. Route lead along torch lead bundle.

9 Trigger

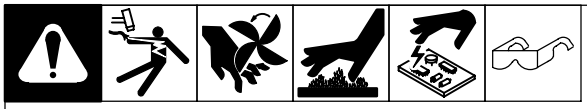
Tools Needed:

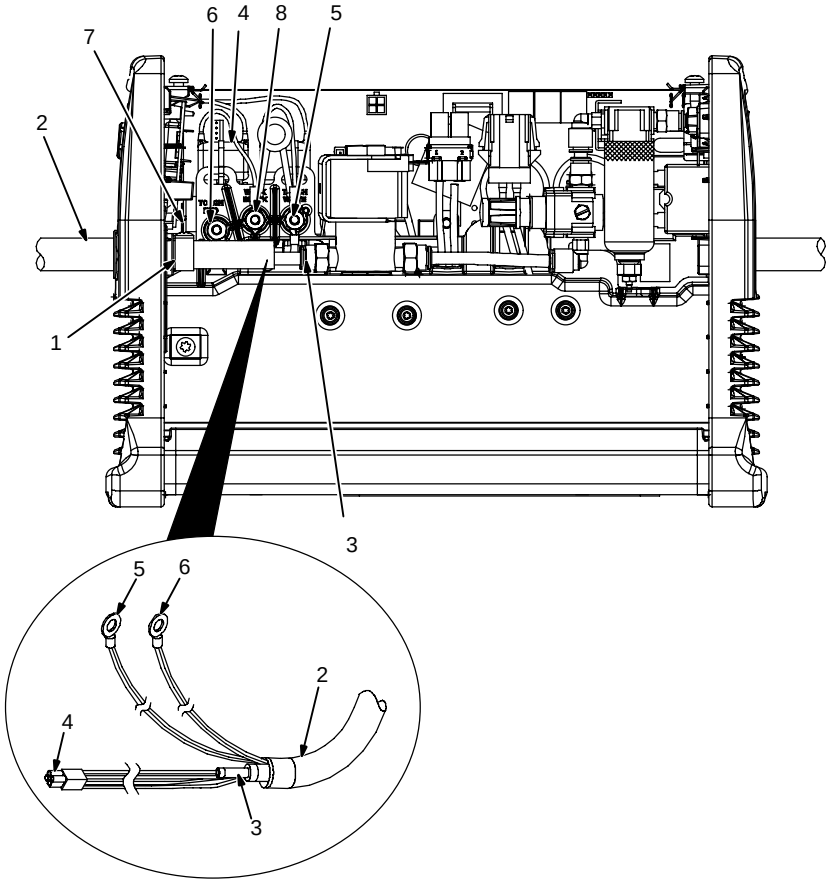


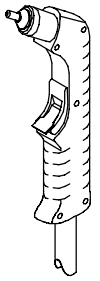
1/4 in

Ref. 802 854 / Ref. 802 860 / 200 173-A / 802 877

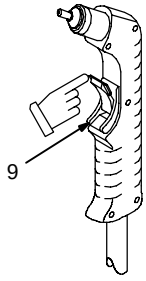
7. Installing 27 Ampere (ICE-27T) Torch And Work Cable, And Using Trigger Safety Lock







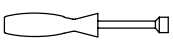
Trigger Locked



Trigger Unlocked

Tools Needed:

Torx 25



1/4 in

⚠ Check DC bus voltage according to Owner's Manual, and be sure voltage is near zero before touching any parts.

If torch or work cable needs to be removed or replaced, proceed as follows:

Turn power Off, and disconnect input power plug from receptacle. Remove wrapper from unit (see Owner's Manual).

Torch Connections

Remove existing torch cable from unit.

1 Strain Relief

Loosen strain relief screw.

2 Torch Cable

Insert cable through strain relief, but do not tighten.

3 Air Line Connector

Insert air line connector into solenoid fitting. Pull slightly on torch to set fitting.

4 Plug PLG1/Receptacle RC1

Connect PLG1 from torch to receptacle RC1 on end of wiring harness connected to circuit board PC1.

5 Ring Terminal And TORCH WHITE Terminal

Connect ring terminal on end of white leads to TORCH WHITE terminal.

6 Ring Terminal And TORCH RED Terminal

Connect ring terminal on end of red leads to TORCH RED terminal.

Tighten strain relief screw.

Work Cable Connections

Remove existing work cable from unit.

7 Strain Relief

Loosen strain relief screw.

☞ *Be sure to allow some work cable slack inside the unit.*

Insert work clamp lead through strain relief, but do not tighten.

8 Work Lead Ring Terminal And WORK BLACK Terminal

Connect ring terminal on end of work clamp lead to terminal labeled WORK BLACK terminal. Route lead along torch lead bundle.

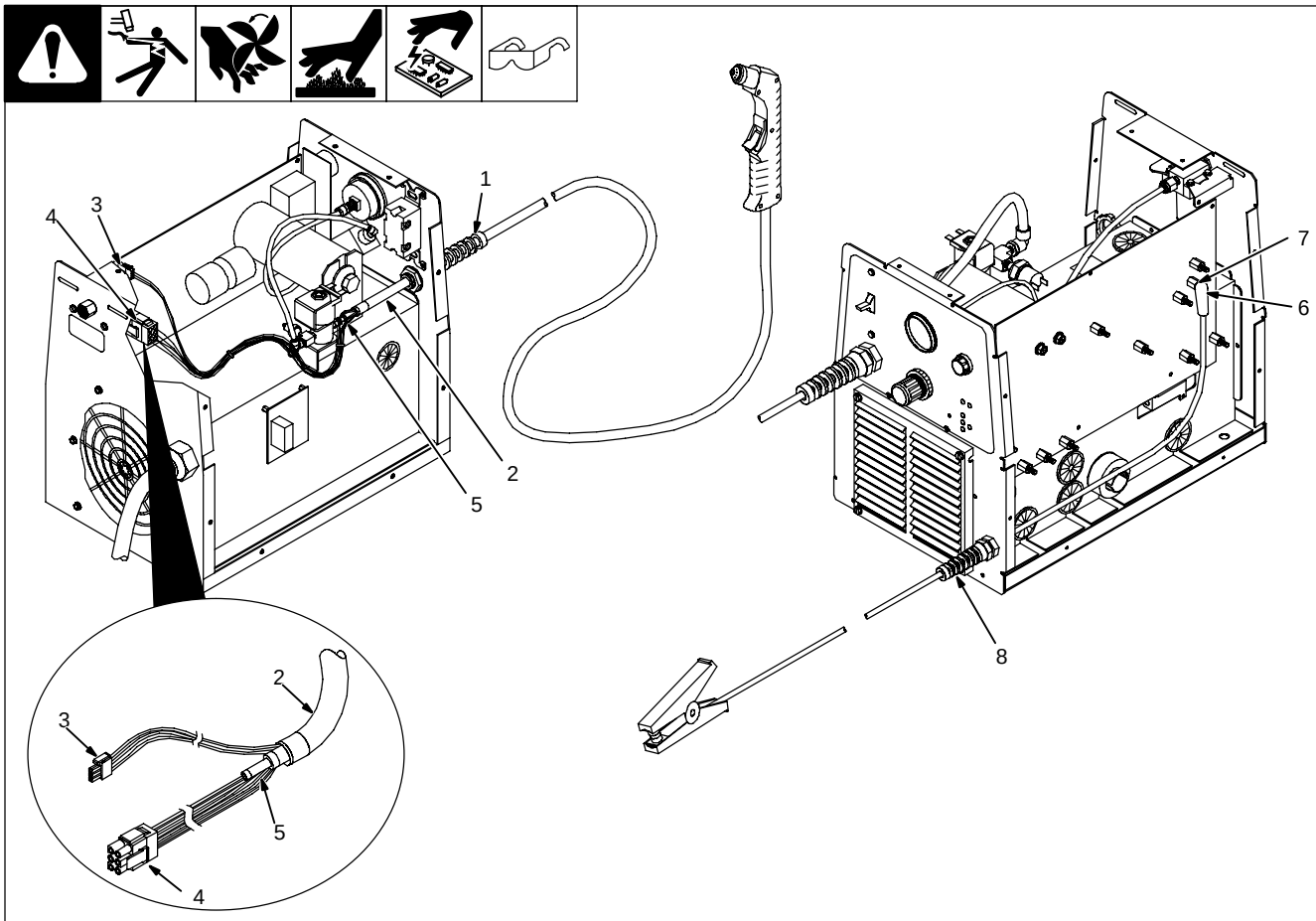
Tighten strain relief screw.

Reinstall wrapper.

9 Trigger

Ref. 804 506-A / Ref. 802 860 / 802 877

8. Installing 40 Ampere Torch And Work Cable



If torch or work cable needs to be removed or replaced, proceed as follows:

⚠ **Turn power Off, and disconnect input power plug from receptacle.**

Remove wrapper from unit.

Torch Replacement

1 Strain Relief

2 Torch Cable

Loosen outer strain relief pigtail so that torch cable can slide freely.

3 Plug PLG1/Receptacle RC1

Disconnect PLG1 from receptacle RC1 on Control board PC1.

4 Plug PLG11/Receptacle RC11

Disconnect PLG11 from receptacle RC11 on Control board PC1.

5 Air Line Connector

Push orange fitting inward toward air solenoid while pulling connector out of fitting.

Remove nut, located inside of unit, from back of strain relief.

Slide torch cable, connector, and plugs through nut and out of unit. Retain nut for use on replacement strain relief.

Insert replacement cable with strain relief through opening where old cable and strain relief were removed. Slide strain relief nut over plugs, connector, and cable. Install nut onto strain relief, but do not tighten.

Insert air line connector into solenoid fitting.

Connect PLG1 to RC1 on Control board PC1.

Connect PLG11 to RC11 on Control board PC1.

Tighten strain relief nut.

Tighten strain relief around cable.

Work Cable Replacement

6 Rubber Boot

7 Work Cable Ring Terminal

Slide rubber boot away from ring terminal connection on Control board PC1. Remove hardware securing ring terminal to PC1.

8 Strain Relief

Remove nut, located inside of unit, from back of strain relief.

Slide work cable through nut and out of unit. Retain nut for use on replacement strain relief.

Slide rubber boot over ring terminal and off of work cable. Retain rubber boot for use on replacement work cable.

☞ *Be sure to allow some work cable slack inside the unit.*

Insert replacement cable with strain relief through opening where old cable and strain relief were removed. Slide strain relief nut over ring terminal and cable. Install nut onto strain relief, but do not tighten.

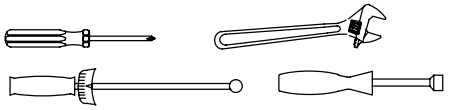
Route cable along bottom of unit and up to PC1.

Slide rubber boot over ring terminal and onto work clamp lead. Connect work cable ring terminal to terminal labeled WORK on circuit board PC1. Torque to 35 in lb (4 N·m). Slide boot over connection.

Tighten strain relief nut.

Tighten strain relief around cable.

Tools Needed:



5/16, 3/8 in

803 386 / 803 385

9. Installing 50 Ampere, 55 Ampere or 80 Ampere Torch And Using Trigger Safety Lock

☞ *The 50 ampere torch is shown in the illustrations below. The procedure for the 55 ampere and 80 ampere torches is identical.*

☞ *The 55 ampere torch <u>can</u> be used on a 50 ampere model power source. The 50 ampere torch <u>cannot</u> be used on a 55 ampere model power source. The 55 ampere power source has a special torch connection receptacle that prevents the 50 ampere torch from being connected.*

Turn Off power source, and disconnect input power plug from receptacle before installing torch.

1 Power Source

2 Torch Connection Receptacle

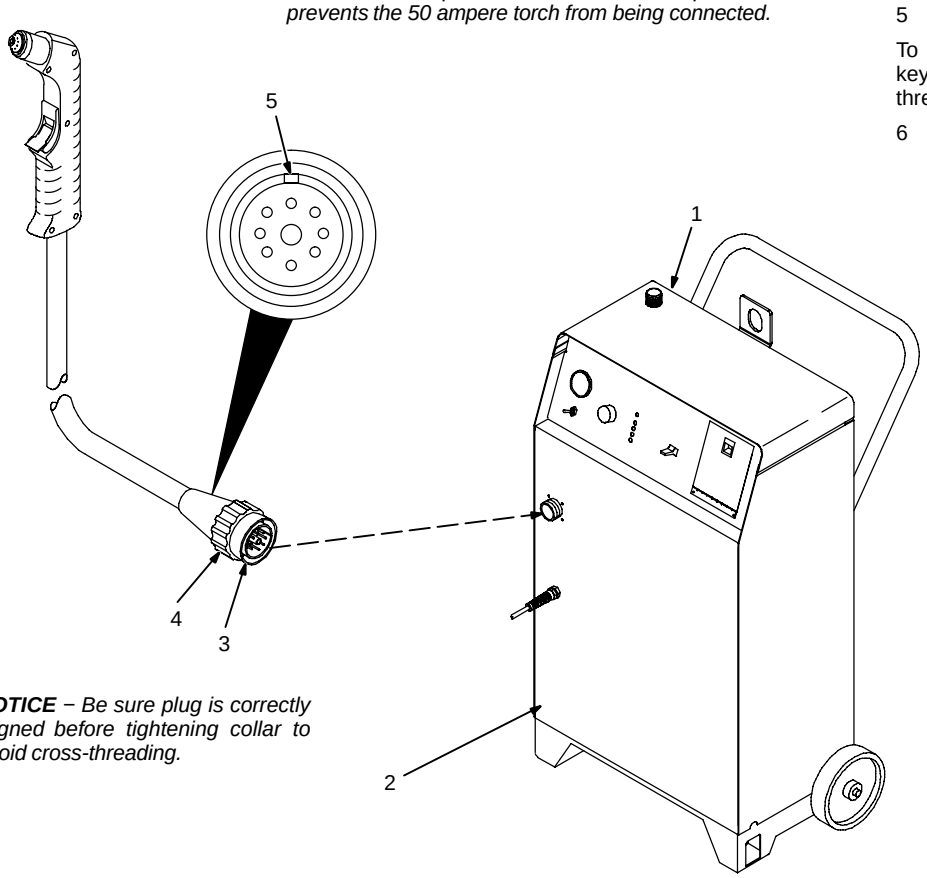
3 Plug

4 Threaded Collar

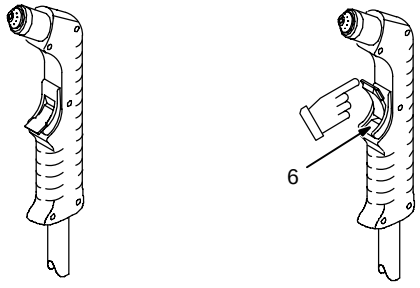
5 Keyway

To connect to receptacle, align keyway, insert plug, and tighten threaded collar.

6 Trigger



NOTICE *− Be sure plug is correctly aligned before tightening collar to avoid cross-threading.*

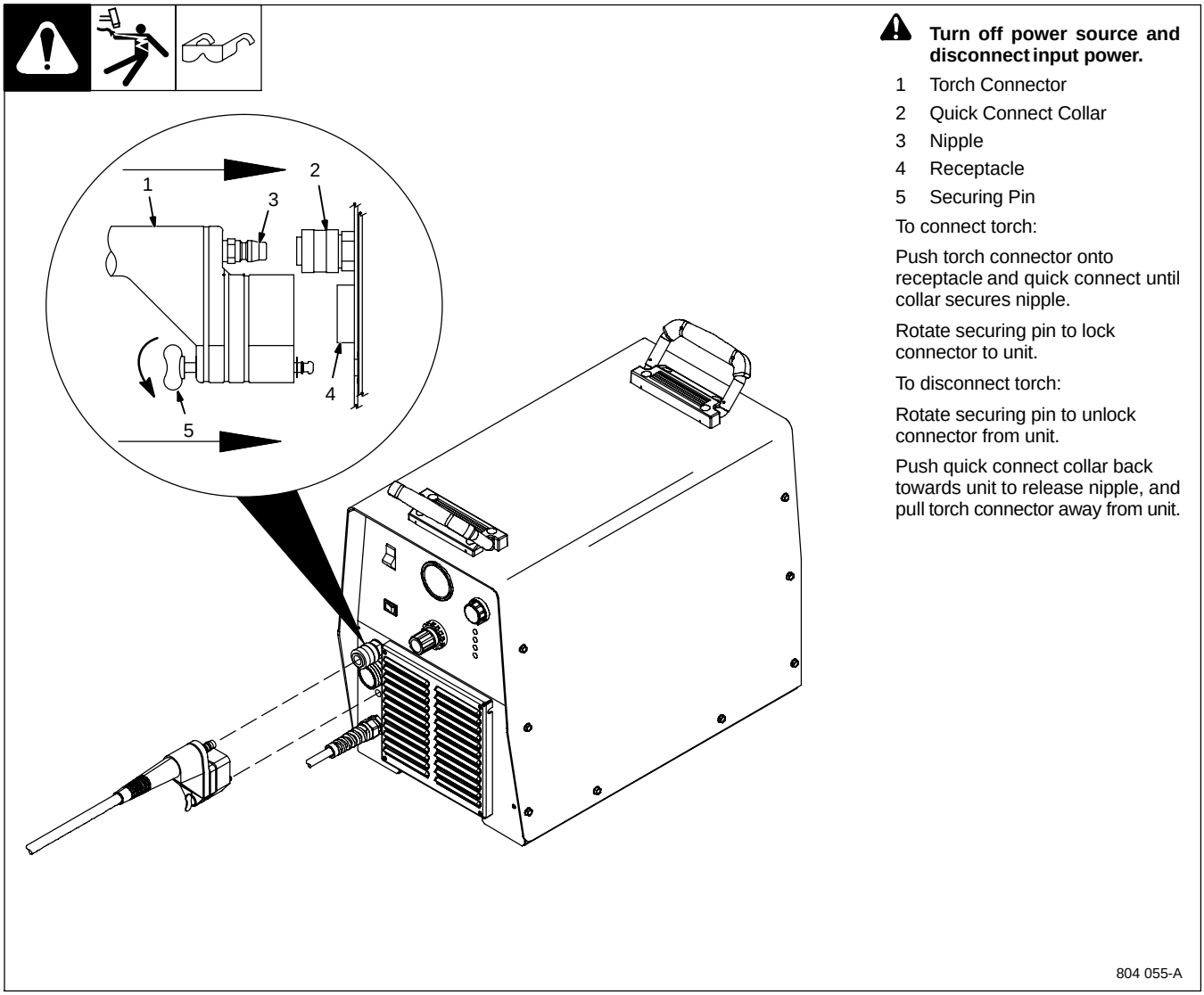


Trigger Locked

Trigger Unlocked

801 395-A / 801 545-A

10. Installing Either 80 Ampere Or 100 Ampere T/TM Torch



Turn off power source and disconnect input power.

1 Torch Connector
2 Quick Connect Collar
3 Nipple
4 Receptacle
5 Securing Pin

To connect torch:

Push torch connector onto receptacle and quick connect until collar secures nipple.

Rotate securing pin to lock connector to unit.

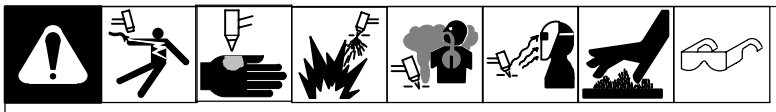
To disconnect torch:

Rotate securing pin to unlock connector from unit.

Push quick connect collar back towards unit to release nipple, and pull torch connector away from unit.

804 055-A

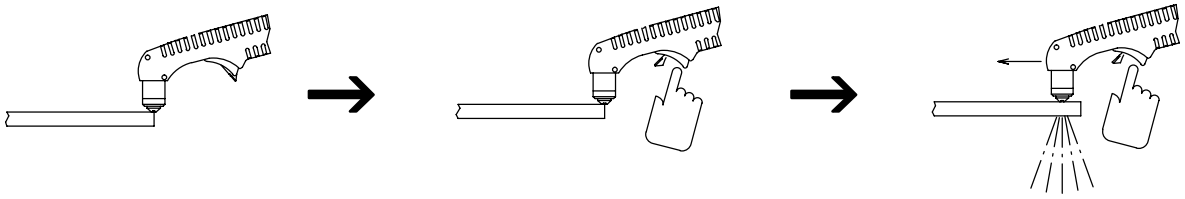
11. Sequence Of Operation For 12 Ampere Torch



EXAMPLE Of Cutting Operation

☞ *Moisture from the compressor will form in the air line and at the torch. It will be normal to sometimes see moisture come out the end of the torch.*

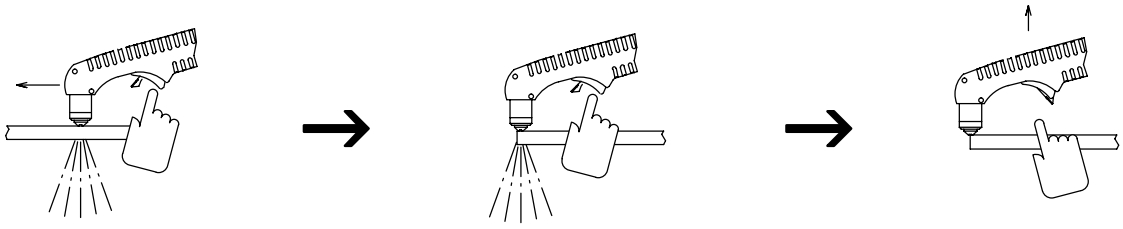
⚠ **The pilot arc starts immediately when trigger is pressed.**



For shielded cutting, place drag shield on edge of metal. For non-shielded cutting (non-CE only), use 1/8 in (3.2 mm) standoff distance (dragging tip will reduce tip life).

Raise trigger lock and press trigger. Pilot arc starts.

After cutting arc starts, slowly start moving torch across metal.



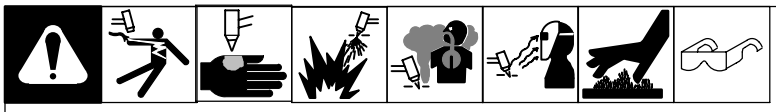
Adjust torch speed so sparks go thru metal and out bottom of cut.

Pause briefly at end of cut before releasing trigger.

Postflow continues for approx. 12 seconds after releasing trigger; cutting arc can be instantly restarted during postflow by raising trigger lock and pressing trigger.

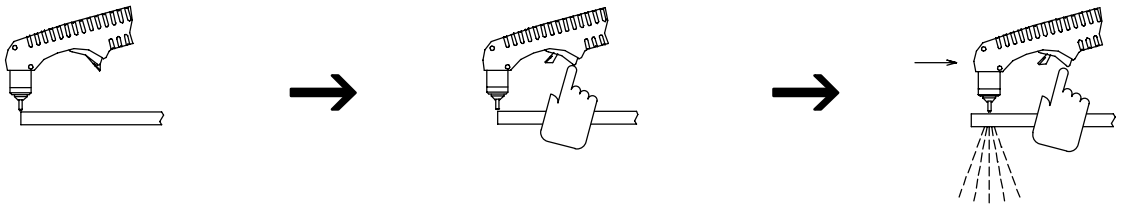
801 400-A

12. Sequence Of Operation For 27 Ampere Torch



EXAMPLE Of Cutting Operation

⚠ **The pilot arc starts immediately when trigger is pressed.**

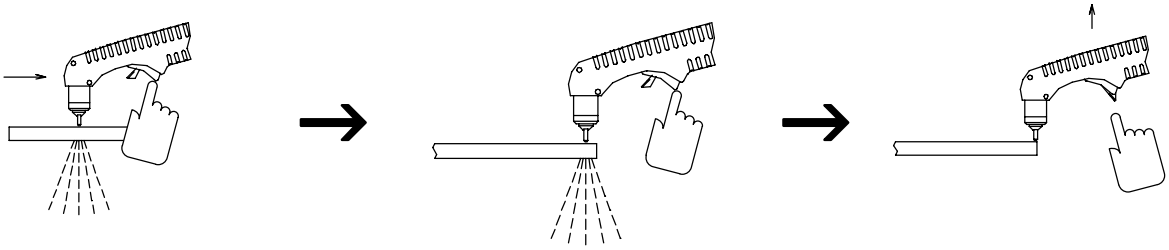


Place tip on work for drag cutting.

☞ *For maximum cutting speed and tip life, use a standoff distance of 1/16 in (1.6 mm) to 1/8 in (3.2 mm). Dragging tip will reduce tip life.*

Raise trigger lock and press trigger. Pilot arc starts.

After cutting arc starts, slowly start moving torch across metal.



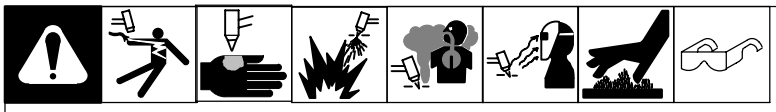
Adjust torch speed so sparks go thru metal and out bottom of cut.

Pause briefly at end of cut before releasing trigger.

Postflow continues for 20 seconds after releasing trigger; cutting arc can be instantly restarted during postflow by raising trigger lock and pressing trigger.

Ref. 802 878

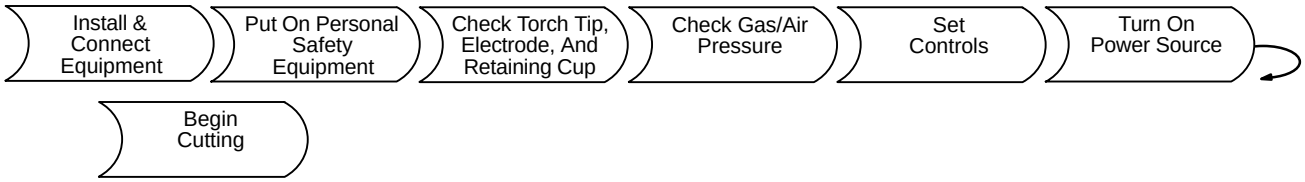
13. Sequence Of Operation For 25, 40, 50, 55, 80, And 100 Ampere Torches



Inspect shield cup, tip, and electrode for wear before cutting or whenever cutting speed has been significantly reduced (see Section 17). Do not operate torch without a tip or electrode in place.

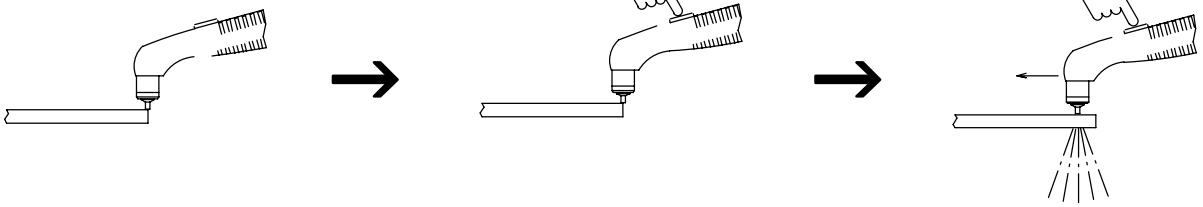
NOTICE *− Do not clean torch by hitting it against a hard surface. Hitting hard surfaces can damage torch parts and stop proper operation.*

NOTICE *− Having pilot arc turn On and Off repeatedly, such as during the cutting of chain fence, will shorten tip, electrode and torch life. Put a continuous piece of sheet metal under the fence to prevent pilot arc from cycling On and Off. Avoid constant starting and restarting of arc.*



EXAMPLE Of Cutting Operation

The pilot arc starts immediately when trigger is pressed.

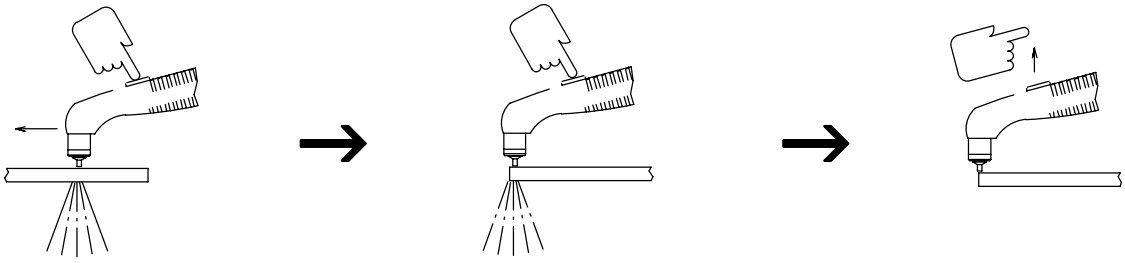


For 25 ampere torch, place tip on edge of metal.

For 40, 50, 80 and 100 ampere hand-held torches, place drag shield on edge of metal, or allow correct standoff distance − approximately 1/8 in (3.2 mm).

Press trigger. Pilot arc starts.

After cutting arc starts, slowly start moving torch across metal.



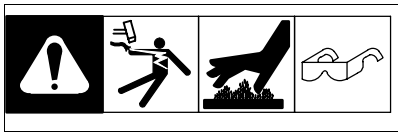
Adjust torch speed so sparks go thru metal and out bottom of cut.

Pause briefly at end of cut before releasing trigger.

Postflow continues for approx. 20 to 30 seconds after releasing trigger; cutting arc can be instantly re-started during postflow by pressing trigger.

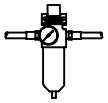
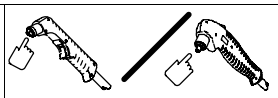
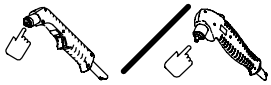
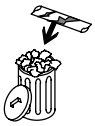
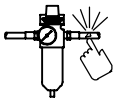
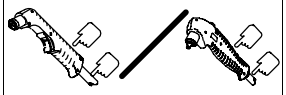
161 698-A

14. Routine Maintenance

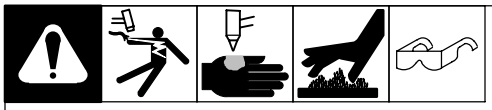


Turn Off power source and disconnect input power plug before maintaining.

☞ *25 ampere torch is shown. Maintenance schedule for 50 and 80 ampere torches is the same.*

	✓ = Check ◇ = Change ◔ = Clean ☆ = Replace * To be done by Factory Authorized Service Agent				Reference
Each Use	 ✓ Check Gas/Air Pressure	 ✓ Torch Tip, Electrode, And Shield Cup			
Every Week	 ✓ Shield Cup Shutdown System				
Every 3 Months	 ☆ Cracked Parts	 ✓ Gas/Air Hose	 ✓ Torch Body, Cable		
	 ✓ Tape Torn Outer Covering				

15. Shield Cup Shutdown System

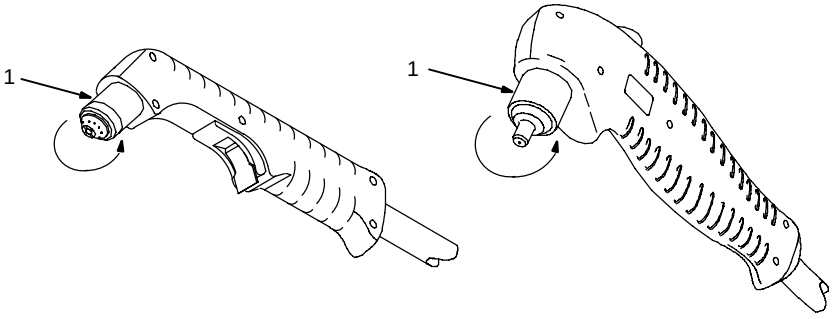


☞ *Power source Power switch must be reset whenever cup shutdown system is activated.* ***Always turn Off power source when changing or checking consumables.***

1 Torch Shield Cup

Turn Power On and loosen shield cup. If shutdown system works properly, Ready light on power source goes off and Cup light comes on. If not, turn power Off and check for proper gas/air pressure, blocked or leaking hose, or loose shield cup.

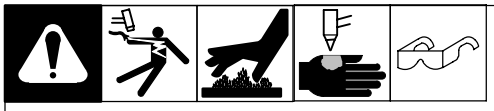
If system works properly, retighten cup and reset power.



☞ *Procedure applies to all torch models.*

Ref. 801 300-A / Ref. 801 300-A

16. Checking/Replacing Retaining Cup, Tip, And Electrode For 12 And 27 Ampere Torch

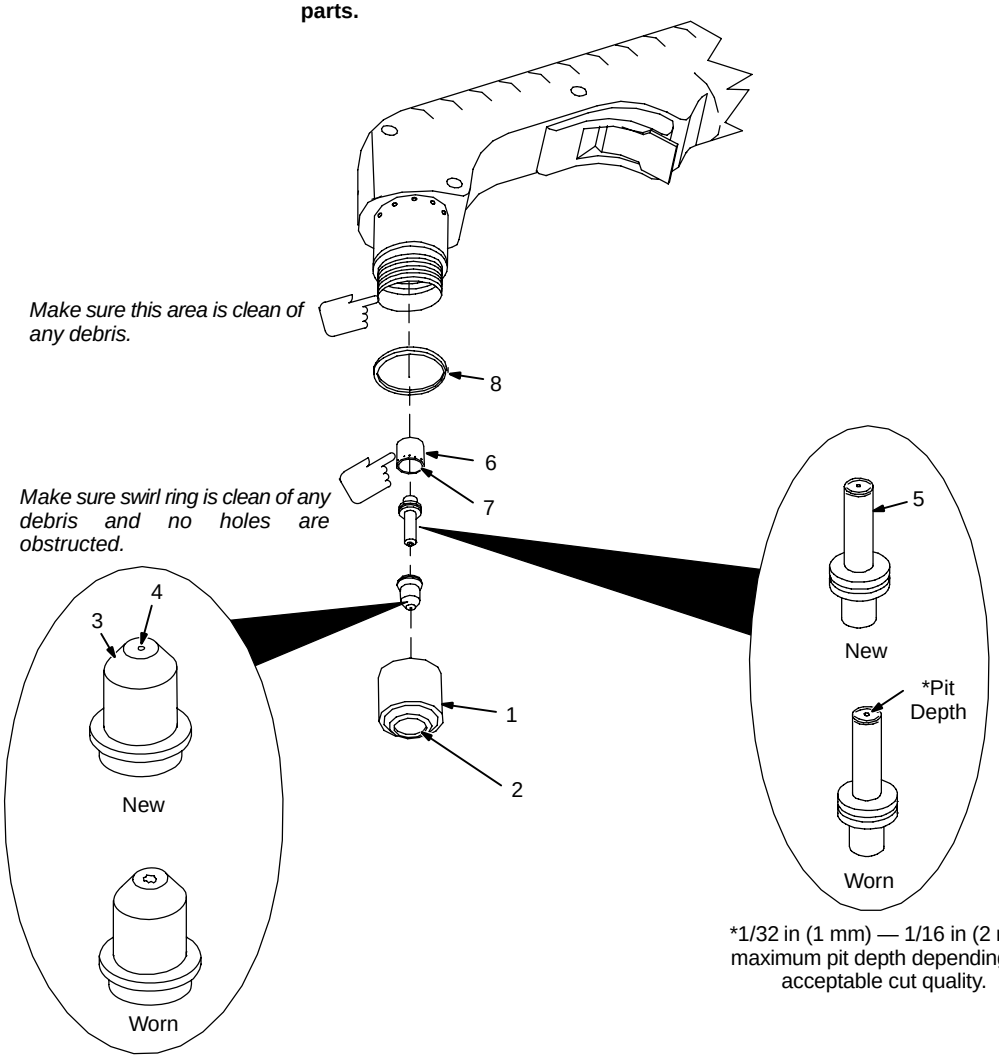


Inspect shield cup, tip, and electrode for wear before cutting or whenever cutting speed has been significantly reduced. Do not operate torch without a tip or electrode in place. Be sure to use genuine replacement parts.

NOTICE *– Overtightening will strip threads. Do not overtighten retaining cup during assembly. Do not cross-thread parts causing stripping. Use care during torch assembly and parts replacement.*

☞ *A good practice is to replace both the tip and electrode at the same time.*

Turn Off power source before checking torch parts.



*1/32 in (1 mm) — 1/16 in (2 mm) maximum pit depth depending on acceptable cut quality.

802 465

Turn Off power source.

1 Shield Cup

2 O-Ring

Remove shield cup. Check cup for cracks, and replace if necessary.

Check O-ring for cracks or worn spots, replace shield cup if necessary.

3 Tip

4 Opening

Remove tip. Check tip, and replace if opening is deformed or 50% oversize. If inside of tip is not clean and bright, clean with steel wool. Be sure to remove any pieces of steel wool afterwards.

5 Electrode

Check electrode. If center has a pit more than a 1/16 in (2 mm) deep, remove and replace electrode.

6 Swirl Ring

7 O-Ring

Remove swirl ring. Check ring, and replace if side holes are plugged.

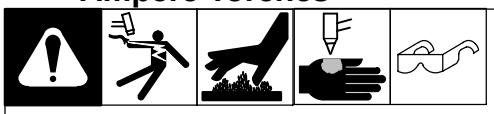
Check O-ring for cracks or worn spots, replace swirl ring if necessary.

8 O-Ring

Check O-ring for cracks or worn spots, and replace if necessary.

Carefully reassemble parts in reverse order.

17. Checking/Replacing Retaining Cup, Tip, And Electrode For 25, 40, 50, And 55 Ampere Torches



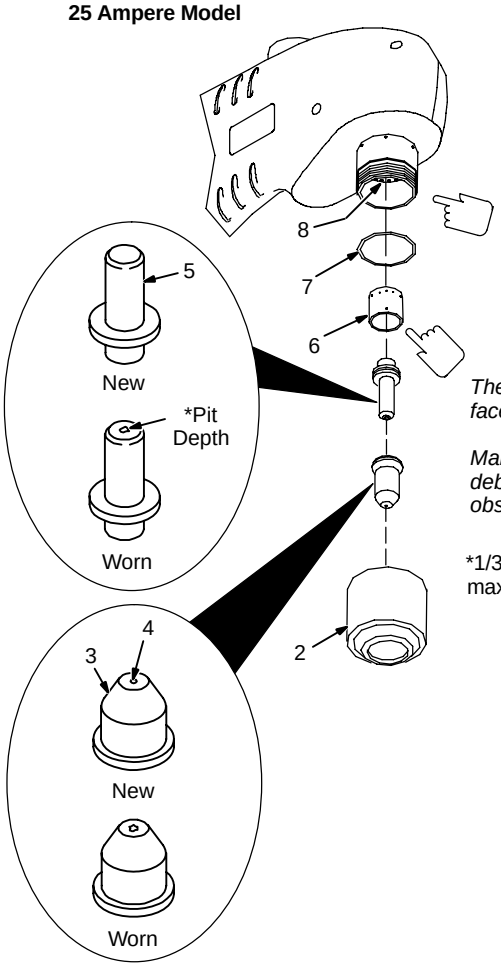
Inspect shield cup, tip, and electrode for wear before cutting or whenever cutting speed has been significantly reduced. Do not operate torch without a tip or electrode in place. Be sure to use genuine replacement parts.

NOTICE *– Overtightening will strip threads. Do not overtighten electrode, tip, and retaining cup during assembly. Do not cross-thread parts causing stripping. Use care during torch assembly and parts replacement.*

☞ *A good practice is to replace both the tip and electrode at the same time.*

Turn Off power source before checking torch parts.

25 Ampere Model



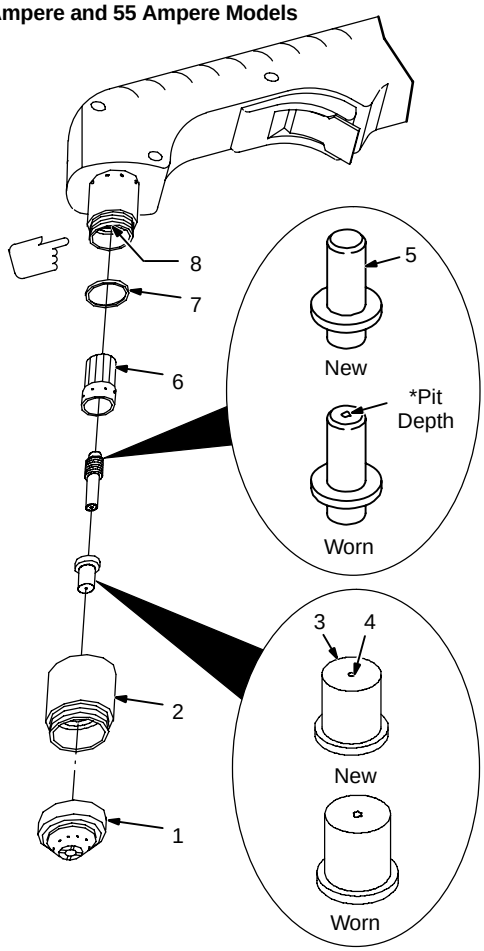
Make sure this area is clean of any debris.

The word "front" on swirl ring must face away from torch body.

Make sure swirl ring is clean of any debris and no holes are obstructed.

*1/32 in (1 mm) — 1/16 in (2 mm) maximum pit depth depending on acceptable cut quality.

50 Ampere and 55 Ampere Models



Ref. 801 301 / 801 139 / Ref. 801 396-A / 801 405

Turn Off power source.

1 Drag Shield

2 Retaining Cup

Remove retaining cup. Check retaining cup for cracks, and replace if necessary.

3 Tip

4 Opening

Remove tip. Check tip, and replace if opening is deformed or 50% oversize. If inside of tip is not clean and bright, clean with steel wool. Be sure to remove any pieces of steel wool afterwards.

5 Electrode

Check electrode. If center has a pit more than a 1/16 in (2 mm) deep, remove and replace electrode.

6 Swirl Ring

Remove swirl ring. Check ring, and replace if side holes are plugged.

7 O-Ring

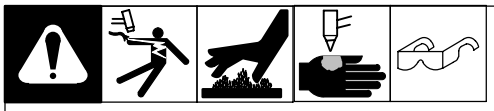
Check O-rings on torch. If needed, coat with thin film of silicone lubricant (part no. 169 231). Replace if damaged.

8 Plunger Area

Check this area for any debris or foreign material. Clean out if necessary.

Carefully reassemble parts in reverse order. For the 25 ampere model, swirl ring must be installed with word "front" facing away from torch body.

18. Checking/Replacing Retaining Cup, Tip, And Electrode For 80 Ampere (C/CM) Torch

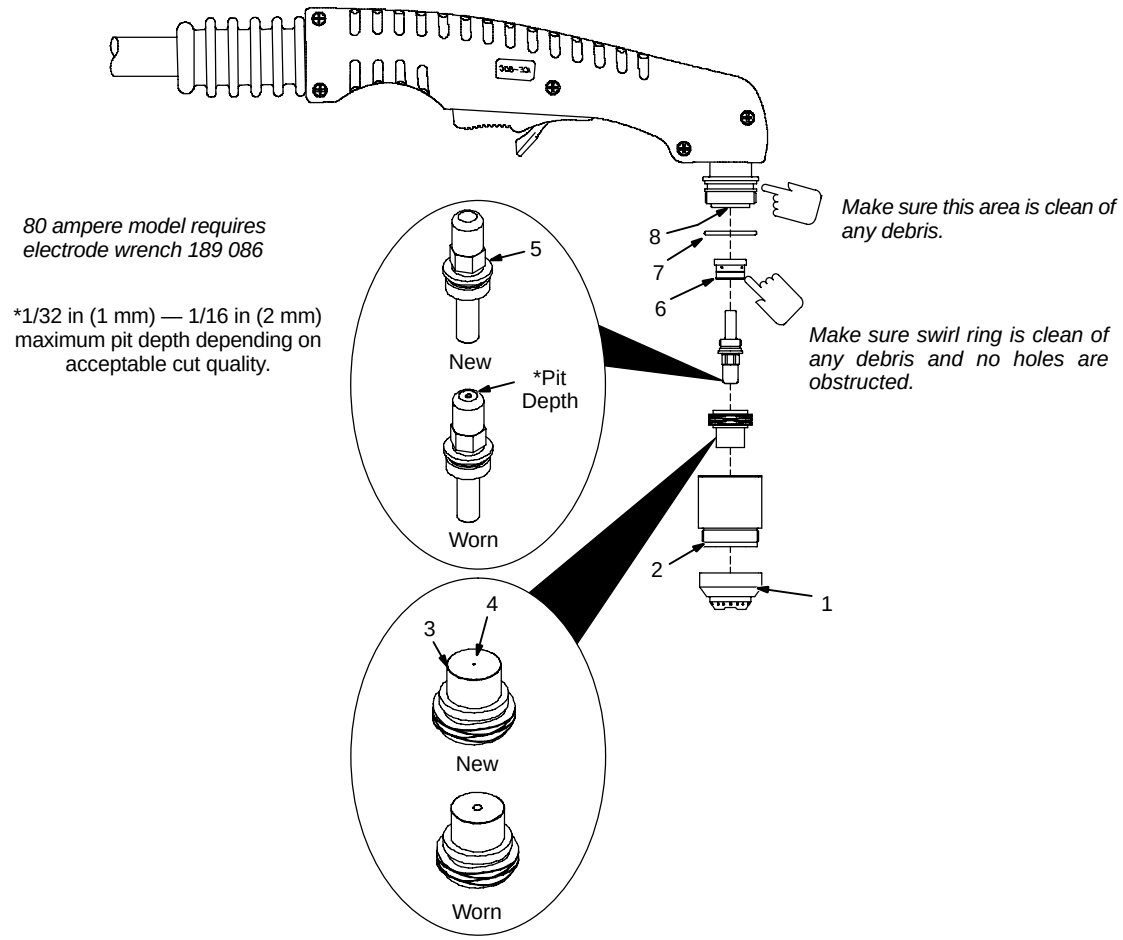


Inspect shield cup, tip, and electrode for wear before cutting or whenever cutting speed has been significantly reduced. Do not operate torch without a tip or electrode in place. Be sure to use genuine replacement parts.

NOTICE *– Overtightening will strip threads. Do not overtighten electrode, tip, and retaining cup during assembly. Do not cross-thread parts causing stripping. Use care during torch assembly and parts replacement.*

☞ *A good practice is to replace both the tip and electrode at the same time.*

Turn Off power source before checking torch parts.



803 612-A

Turn Off power source.

1 Drag Shield

2 Retaining Cup

Remove retaining cup. Check retaining cup for cracks, and replace if necessary.

3 Tip

4 Opening

Remove tip. Check tip, and replace if opening is deformed or 50% oversize. If inside of tip is not clean and bright, clean with steel wool. Be sure to remove any pieces of steel wool afterwards.

5 Electrode

Check electrode. If center has a pit more than a 1/16 in (2 mm) deep, remove and replace electrode.

6 Swirl Ring

Remove swirl ring. Check ring, and replace if side holes are plugged.

7 O-Ring

Check O-rings on torch. If needed, coat with thin film of silicone lubricant (part no. 169 231). Replace if damaged.

8 Torch Head

Check this area for any debris or foreign material. Clean out if necessary.

Carefully reassemble parts in reverse order.

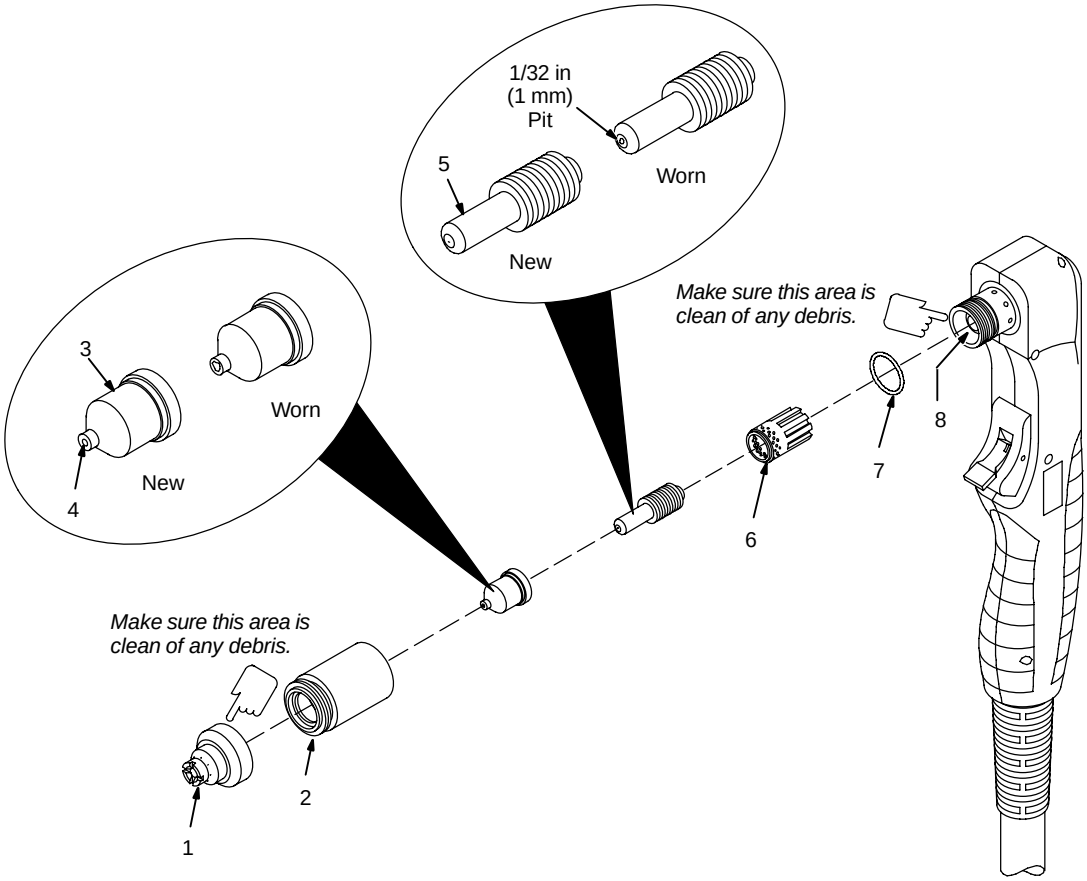
19. Checking/Replacing Retaining Cup, Tip, And Electrode For 80 Ampere (CX/CXM/T/TM, And 100 T/TM) Torch

Inspect shield cup, tip, and electrode for wear before cutting or whenever cutting speed has been significantly reduced. Do not operate torch without a tip or electrode in place. Be sure to use genuine replacement parts.

NOTICE *− Overtightening will strip threads. Do not overtighten electrode, tip, and retaining cup during assembly. Do not cross-thread parts causing stripping. Use care during torch assembly and parts replacement.*

☞ *A good practice is to replace both the tip and electrode at the same time.*

Turn Off power source before checking torch parts.



804 056-A

Turn Off power source.

1 Drag Shield

Check this area for any debris or foreign material. Clean out if necessary.

2 Retaining Cup

Remove retaining cup. Check retaining cup for cracks, and replace if necessary.

3 Tip

4 Opening

Remove tip. Check tip, and replace if opening is deformed or 50% oversize. If inside of tip is not clean and bright, clean with steel wool. Be sure to remove any pieces of steel wool afterwards.

5 Electrode

Check electrode. If center has a pit more than a 1/32 in (1 mm) deep, remove and replace electrode.

6 Swirl Ring

Remove swirl ring. Check ring, and replace if side holes are plugged.

7 O-Ring

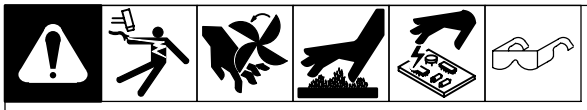
Check O-rings on torch. If needed, coat with thin film of silicone lubricant (part no. 169 231). Replace if damaged.

8 Plunger Area

Check this area for any debris or foreign material. Clean out if necessary.

Carefully reassemble parts in reverse order.

20. Troubleshooting For 12 Ampere Torch



Does arc go on and off while cutting?

Yes → Torch travel speed too slow; increase travel speed (see Power Source Owner's Manual). Clean or replace torch consumables as necessary (see Section 16). Be sure work clamp is securely attached to workpiece. → See Power Source Owner's Manual.

No

Does arc go out while cutting?

Yes → Be sure work clamp is securely attached to work-piece. Make sure drag shield contacts metal while cutting. Clean or replace torch consumables as necessary (see Section 16). → See Power Source Owner's Manual.

No

Do sparks come out of top of cut; or cut is not clean?

Yes → Torch travel speed too fast; reduce travel speed (see Power Source Owner's Manual). Clean or replace torch consumables as necessary (see Section 16). Be sure work clamp is securely attached to workpiece. Unit not capable of cutting metals thicker than rating (see Section 1).

No

Is Trouble light On; unit has no cutting output?

Yes → Check torch shield cup (see Section 15); reset unit Power switch. *Check torch and connections inside unit. → See Power Source Owner's Manual.

No

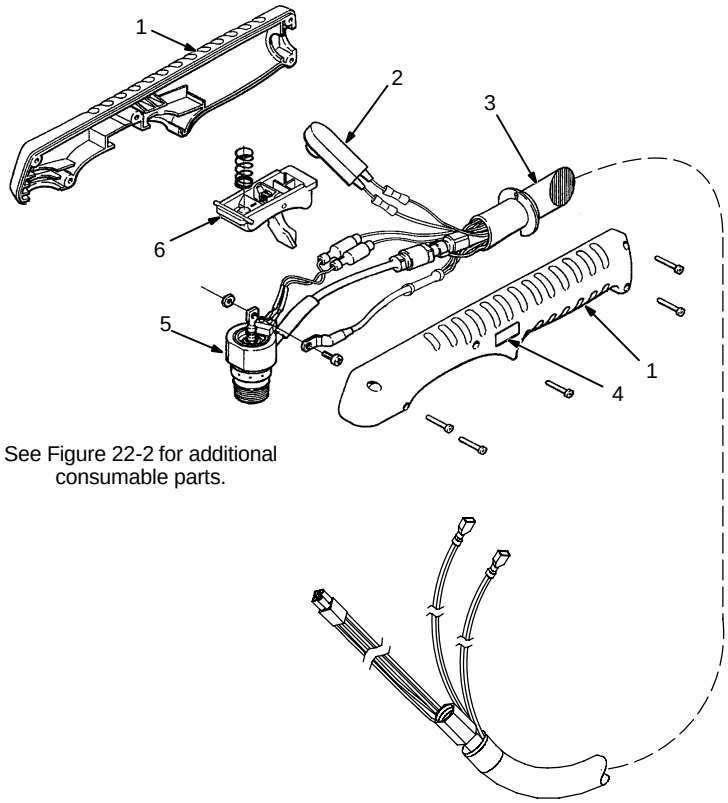
See Power Source Owner's Manual.

*Servicing procedure to be performed only by authorized Service Station.

21. Troubleshooting For 25, 27, 40, 50, 55, 80, And 100 Ampere Torches

Trouble	Remedy
Power source Cup trouble light On; no cutting output.	Tighten cup onto torch and reset Power (see Section 15).
	Check torch connections on power source. See power source Owner's Manual.
Sparks come out top of cut, or cut is not clean.	Torch travel speed too fast; reduce travel speed (see Section 13).
	Clean or replace worn consumables as necessary (see Section 17).
	Metal being cut is too thick; increase output control setting. See power source Owner's Manual.
	Be sure work clamp is securely attached. See power source Owner's Manual.
Arc goes out while cutting.	Make sure torch tip is contacting metal while cutting.
	Be sure work clamp is securely attached. See power source Owner's Manual.
	Clean or replace worn consumables as necessary (see Section 17).
Arc goes on and off while cutting.	Torch travel speed is too slow; increase travel speed (see Section 13).
	Clean or replace worn consumables as necessary (see Section 17).
	Be sure work clamp is securely attached. See power source Owner's Manual.

22. Parts Lists



Item No.	Part No.	Description
1	183 427	Handle Assy, left and right w/screws (1)
2	171 248	Pushbutton Switch (1)
3	196 931	Leads, 20ft (1)
4	196 930	Label, ICE-12C (1)
5	196 932	Main Body (1)
6	185 833	Switch Assy w/Spring (1)
	190 220	Spring, trigger assy (1)
	169 231	Grease, silicone (1)
	196 923	Torch, replacement 20ft (1)

Figure 22-1. Torch, ICE-12C

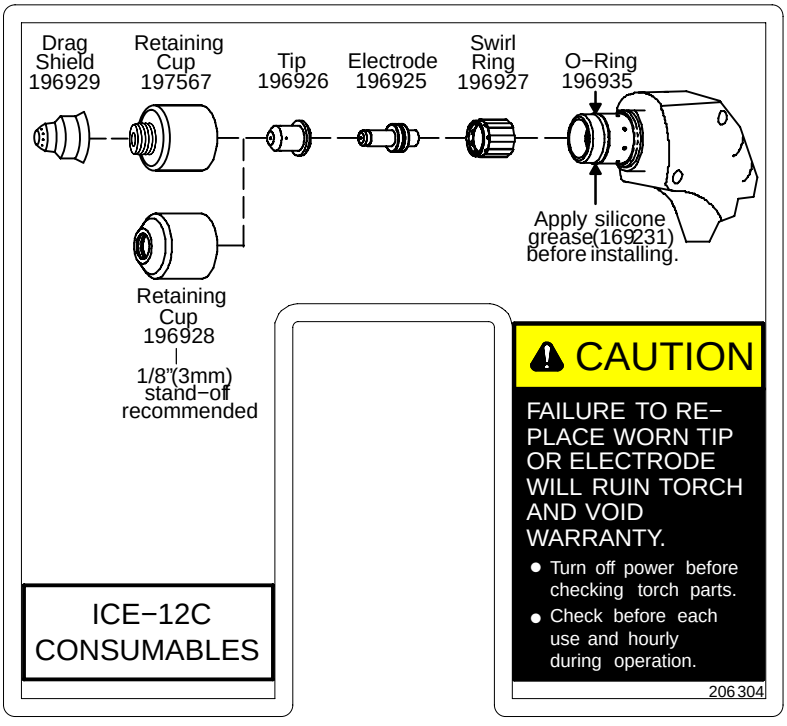
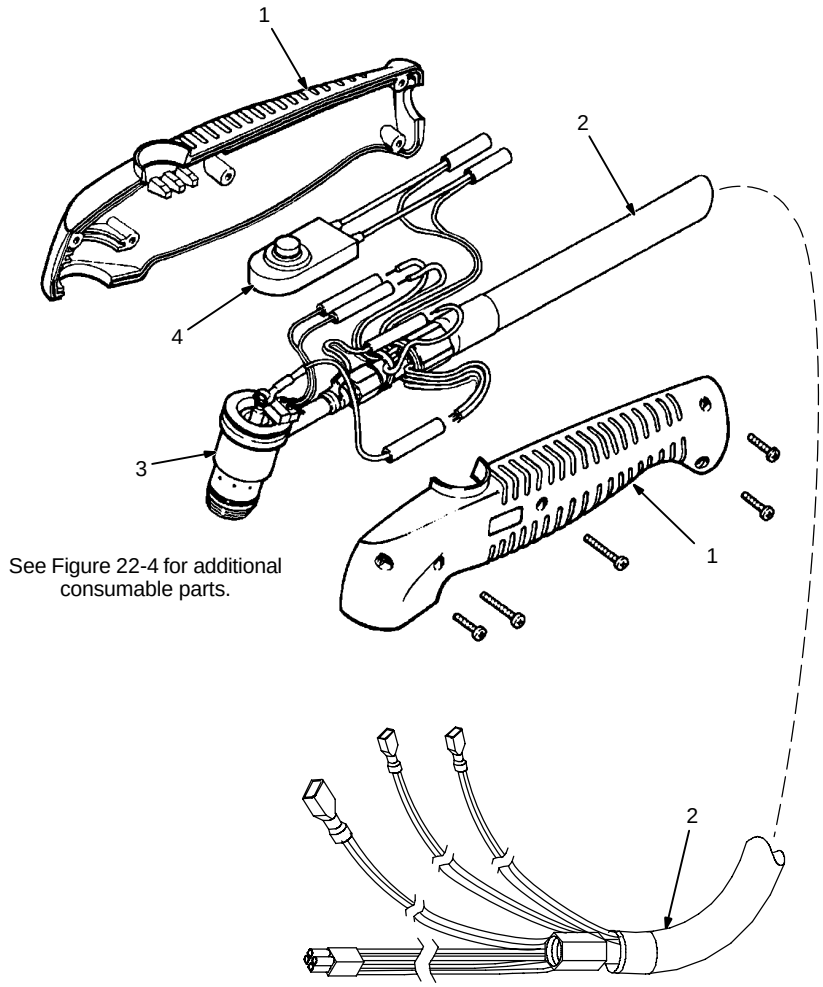


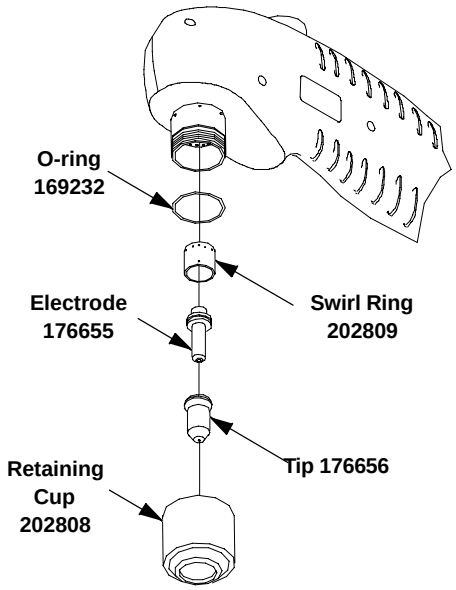
Figure 22-2. Consumable Parts For ICE-12C



Item No.	Part No.	Description
1	183 428	Handle Assy, complete (1)
2	177 893	Leads, 15ft (1)
2	177 894	Leads, 25ft (1)
3	178 550	Main Body (1)
4	171 248	Push Button Switch (1)
	169 231	Grease, silicone (1)
	195 007	Torch, replacement 20ft (1)

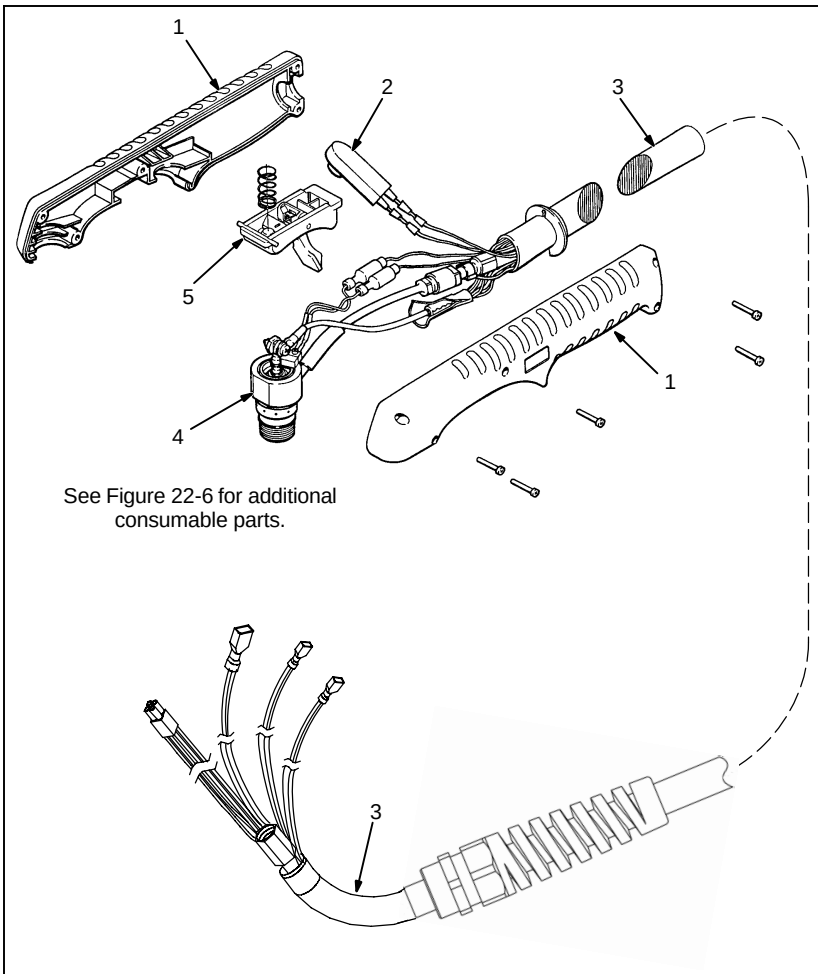
Ref. 801 300-B

Figure 22-3. Torch, ICE-25C



Ref. 178 744

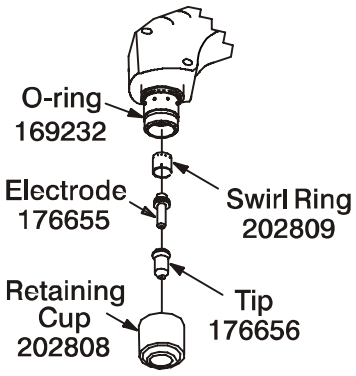
Figure 22-4. Consumable Parts For ICE-25C



Item No.	Part No.	Description
1	183 427	Handle Assy, complete (1)
2	171 248	Push Button Switch (1)
3	205 881	Leads, 20ft (1)
4	203 119	Main Body (1)
5	185 833	Switch Assembly w/spring (1)
	190 220	Spring, trigger assembly
	169 231	Grease, silicone (1)
	195 007	Torch, replacement 20ft (1)

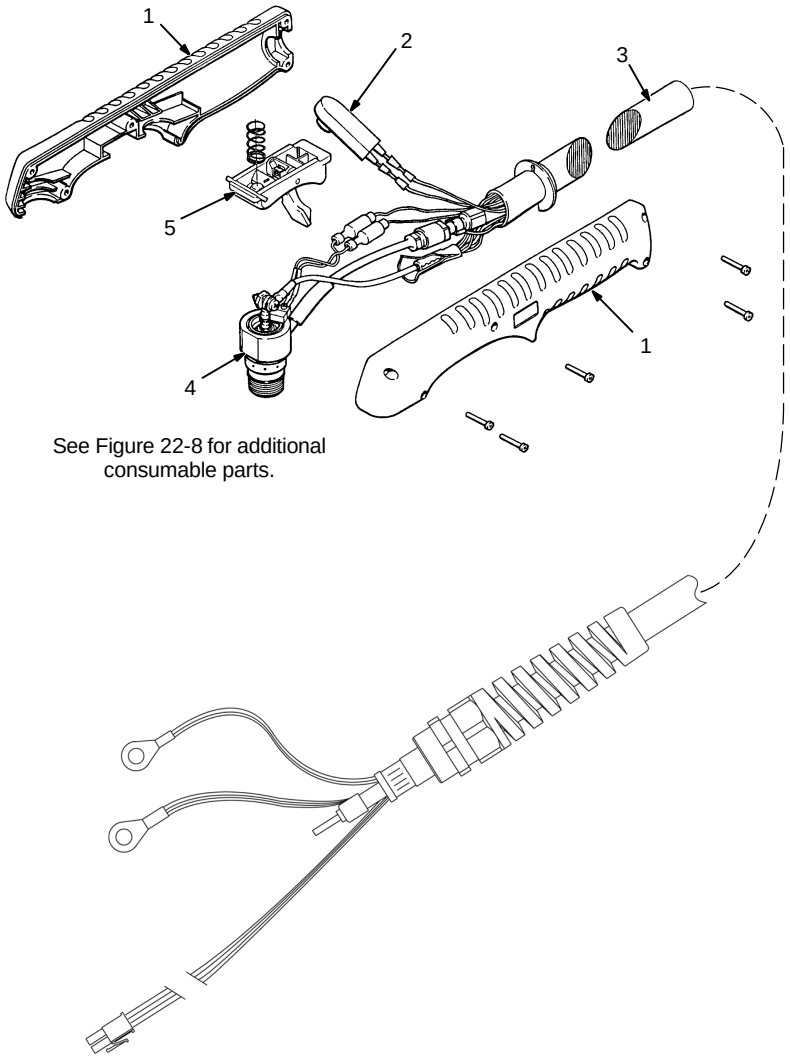
Ref. 801 300-B

Figure 22-5. Torch, ICE-25CX



Ref. 202 108-A

Figure 22-6. Consumable Parts For ICE-25CX



Item No.	Part No.	Description
1	183 427	Handle Assy, complete (1)
2	171 248	Push Button Switch (1)
3	203 120	Leads, 20ft (1)
4	203 119	Main Body (1)
5	185 833	Switch Assembly w/spring (1)
	190 220	Spring, trigger assembly
	169 231	Grease, silicone (1)
	195 014	Torch, replacement 20ft (1)

Figure 22-7. Torch, ICE-27C

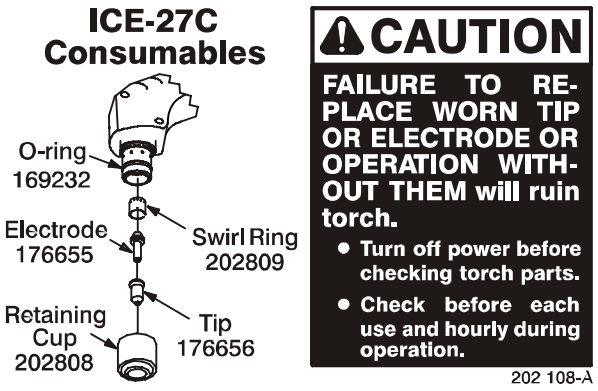
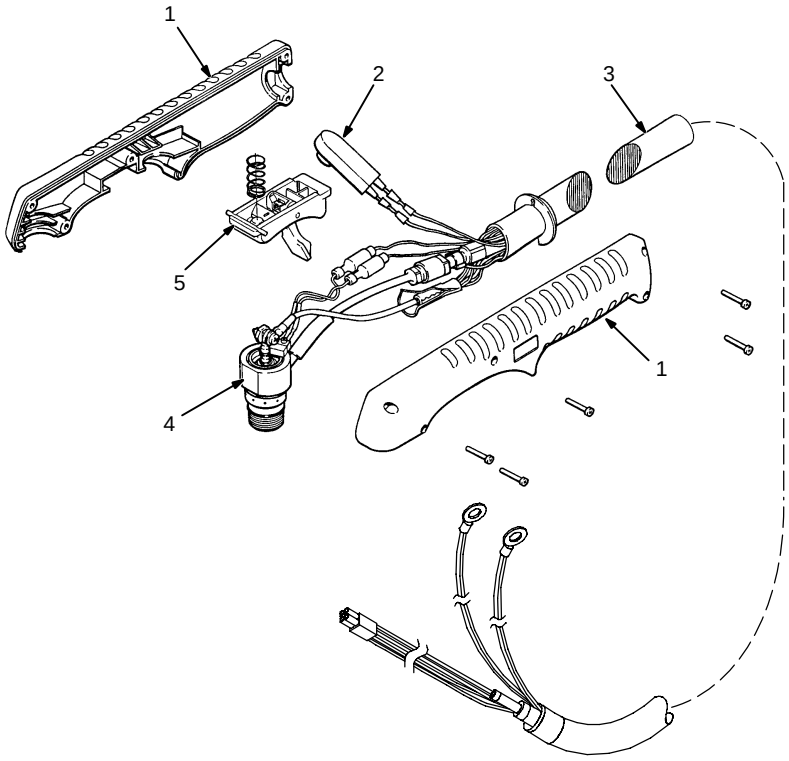

ICE-27C Consumables
O-ring 169232
Electrode 176655
Swirl Ring 202809
Retaining Cup 202808
Tip 176656
CAUTION
FAILURE TO REPLACE WORN TIP OR ELECTRODE OR OPERATION WITHOUT THEM will ruin torch.
Turn off power before checking torch parts.
Check before each use and hourly during operation.
202 108-A
202 108-A

Figure 22-8. Consumable Parts For ICE-27C



Item No.	Part No.	Description
1	183 427	Handle Assy, complete (1)
2	171 248	Push Button Switch (1)
3	228 405	Leads, 12 ft (1)
4	203 119	Main Body (1)
5	185 833	Switch Assembly w/spring (1)
	190 220	Spring, trigger assembly
	169 231	Grease, silicone (1)
	225 615	Torch, replacement 12 ft (1)

See 22-10 for additional consumable parts.

Figure 22-9. Torch, ICE-27T

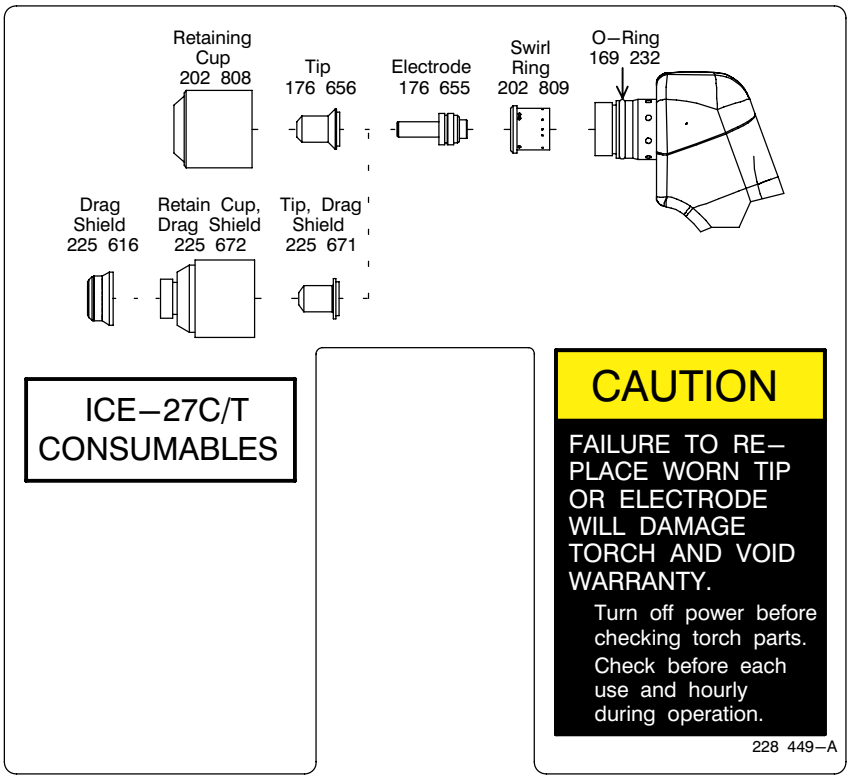
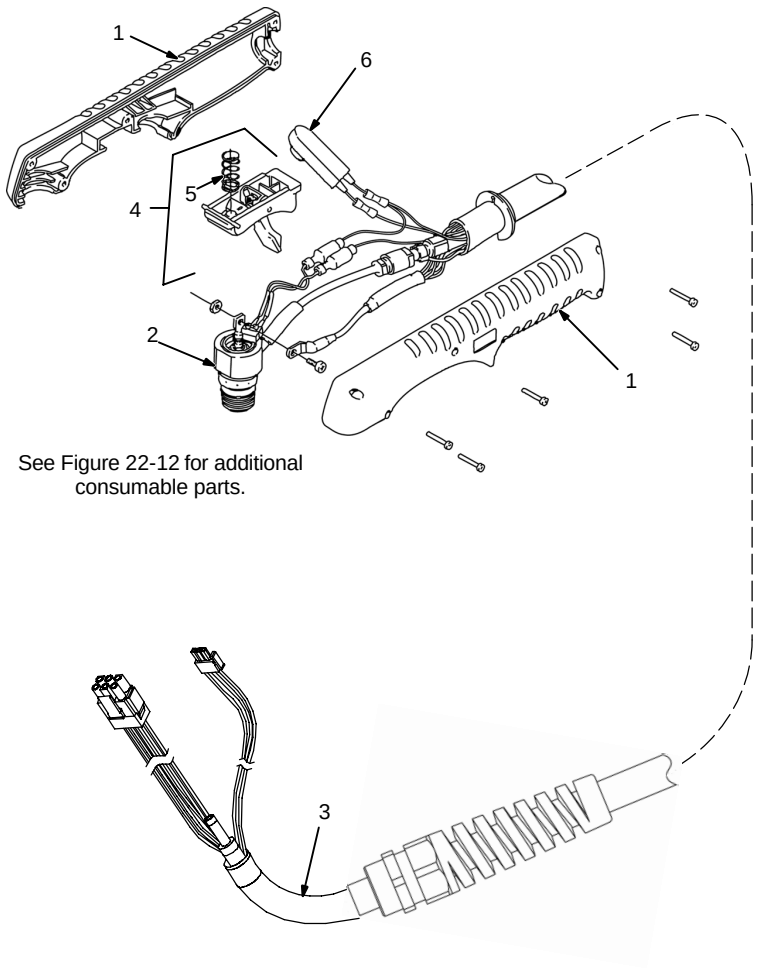

Retaining Cup 202 808
Tip 176 656
Electrode 176 655
Swirl Ring 202 809
O–Ring 169 232
Drag Shield 225 616
Retain Cup, Drag Shield 225 672
Tip, Drag Shield 225 671
ICE–27C/T CONSUMABLES
CAUTION
FAILURE TO RE–PLACE WORN TIP OR ELECTRODE WILL DAMAGE TORCH AND VOID WARRANTY.
Turn off power before checking torch parts.
Check before each use and hourly during operation.
228 449–A
228 449-A

Figure 22-10. Consumable Parts For ICE-27C/T

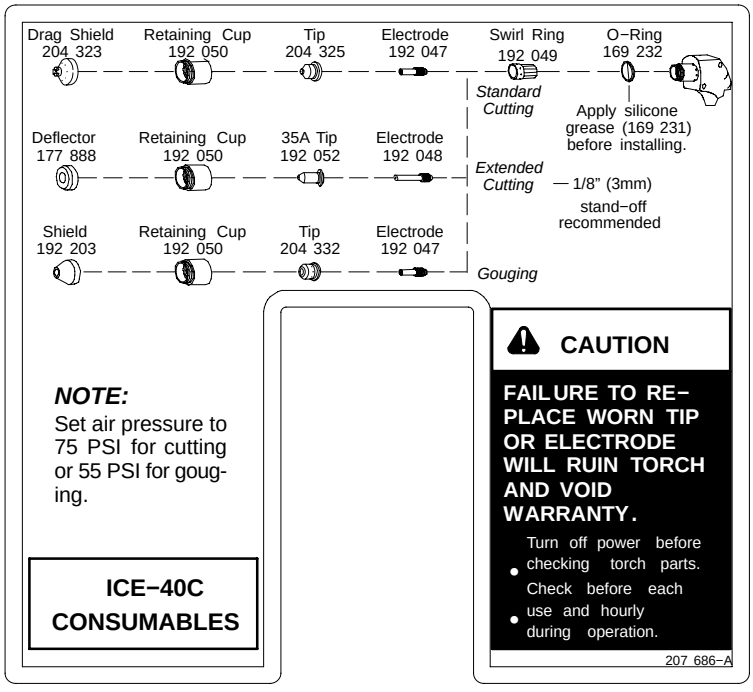


Item No.	Part No.	Description
	195 110	**ICE-40C 25ft Torch**
	195 111	**ICE-40C 50ft Torch**
1	183 427	Handle Assy, complete (1)
2	192 059	Main Body (1)
3	209 298	Leads, 25ft (1)
3	209 299	Leads, 50ft (1)
4	185 833	Switch Assembly w/spring (1)
5	190 220	Spring, trigger assembly
6	171 248	Push Button Switch (1)
	169 231	Grease, silicone (1)

Ref. 803 386

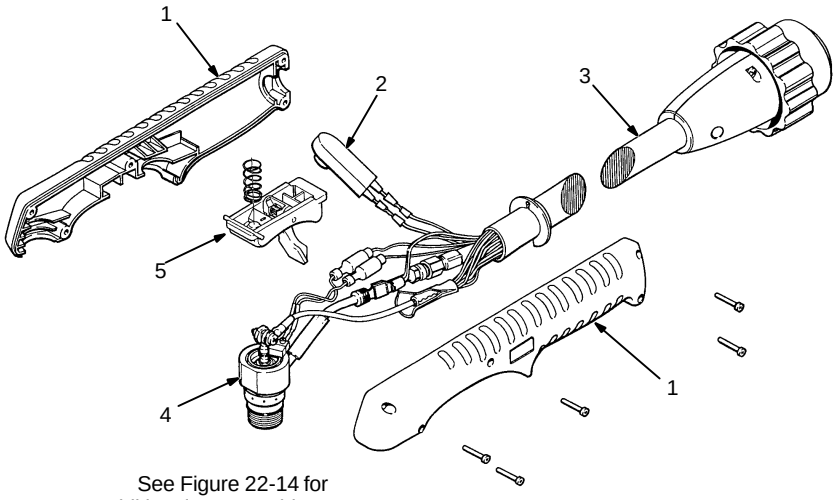
Figure 22-11. Torch, ICE-40C

For extended tip use, set Amperage control to 35.


Drag Shield 204 323
Retaining Cup 192 050
Tip 204 325
Electrode 192 047
Swirl Ring 192 049
O−Ring 169 232
Standard Cutting
Apply silicone grease (169 231) before installing.
Deflector 177 888
Retaining Cup 192 050
35A Tip 192 052
Electrode 192 048
Extended Cutting
— 1/8" (3mm) stand−off recommended
Shield 192 203
Retaining Cup 192 050
Tip 204 332
Electrode 192 047
Gouging
NOTE:
Set air pressure to 75 PSI for cutting or 55 PSI for gouging.
ICE−40C CONSUMABLES
CAUTION
FAILURE TO RE−PLACE WORN TIP OR ELECTRODE WILL RUIN TORCH AND VOID WARRANTY.
• Turn off power before checking torch parts.
• Check before each use and hourly during operation.
207 686−A

207 686-A

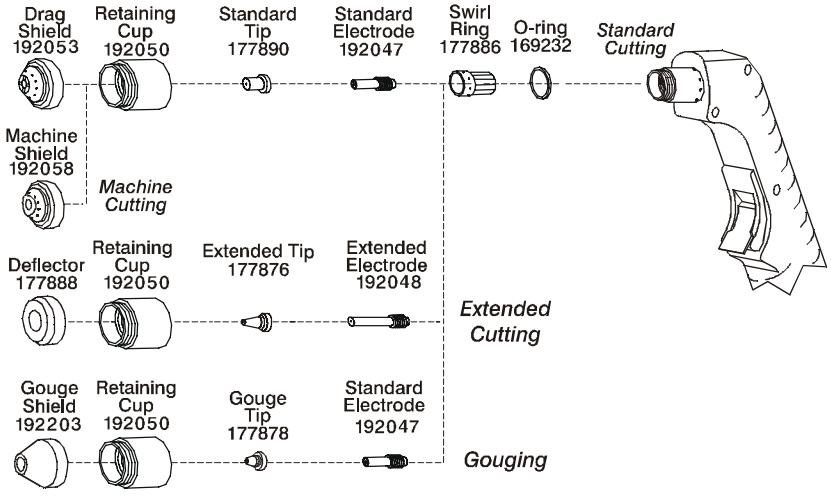
Figure 22-12. Consumable Parts For ICE-40C



See Figure 22-14 for additional consumable parts.

Item No.	Part No.	Description
1	183 427	Handle Assy, complete (1)
2	171 248	Push Button Switch (1)
3	179 829	Leads, 25ft (1)
3	179 830	Leads, 50ft (1)
4	188 794	Main Body (1)
5	185 833	Switch Assembly w/spring (1)
	190 220	Spring, trigger assembly
	169 231	Grease, silicone (1)
	176 824	Torch, replacement 25ft (1)
	176 826	Torch, replacement 50ft (1)

Figure 22-13. Torch, ICE-50C



Ref. S-180 338-C

Figure 22-14. Consumable Parts For ICE-50C And 50CM

Item No.	Part No.	Description
1	192 050	Cup, shield (1)
2	169 232	O-Ring, 55A (1)
3	180 343	Main Body (1)
4	180 610	Position Sleeve (1)
5	180 342	Leads, 50ft (1)
6	180 605	Remote Pendent Control (1)
7	180 611	Torch Sleeve (1)
8	192 058	Shield, machine (1)
	169 231	Grease, silicone (1)
	176 828	Torch, replacement 50ft (1)

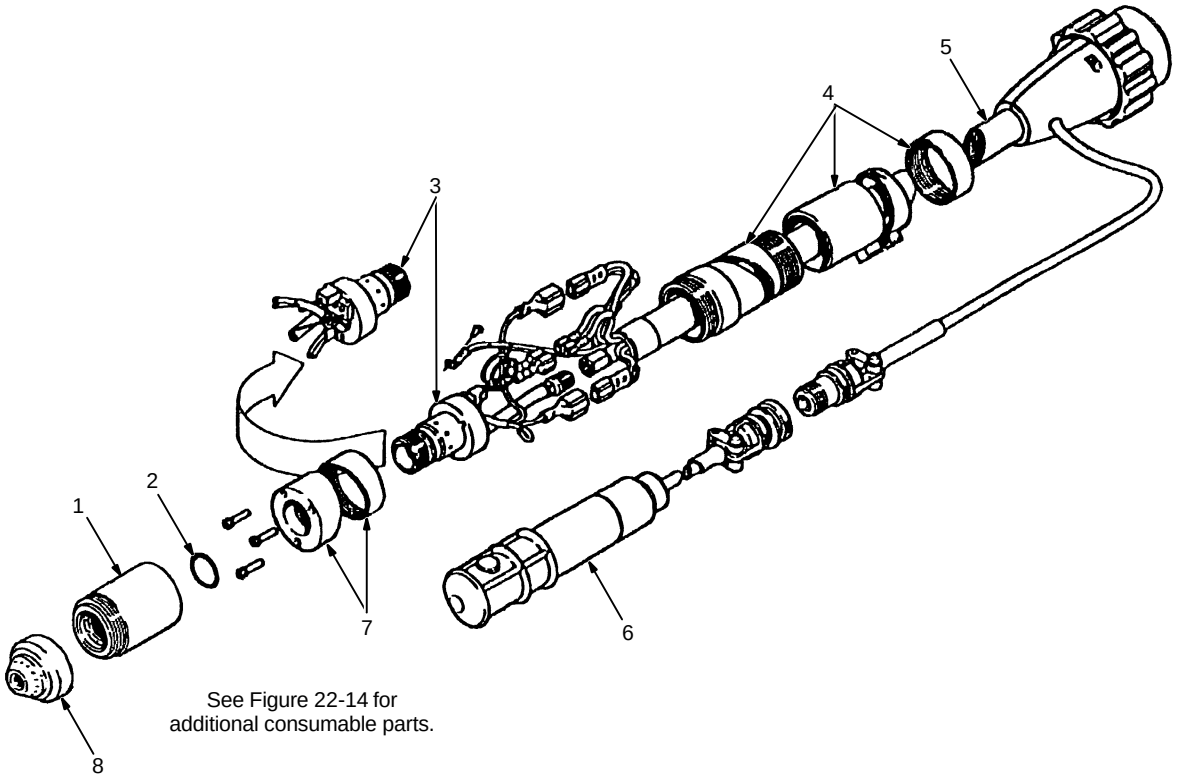
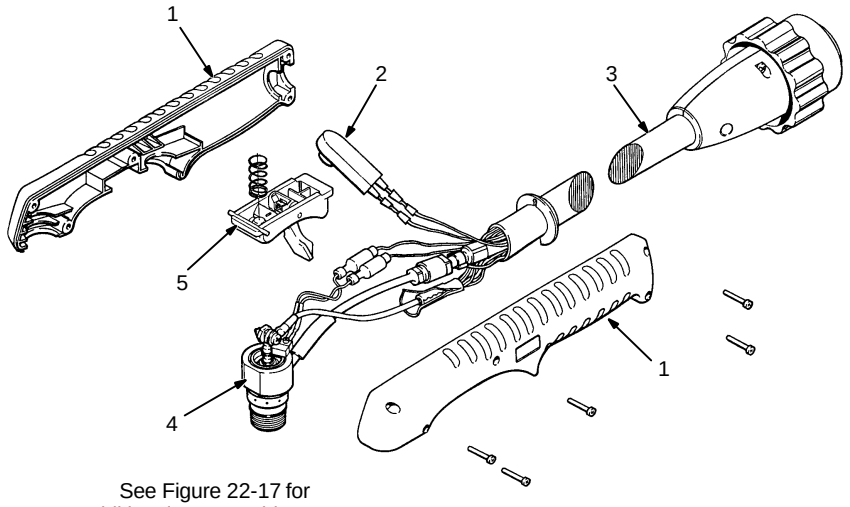


Figure 22-15. Torch, ICE-50CM



See Figure 22-17 for additional consumable parts.

Item No.	Part No.	Description
1	183 427	Handle Assy, complete (1)
2	171 248	Push Button Switch (1)
3	192 062	Leads, 25ft (1)
3	192 063	Leads, 50ft (1)
4	192 059	Main Body (1)
	202 932	Plunger Kit (for out-of-warranty torches)
5	185 833	Switch Assembly w/spring (1)
	190 220	Spring, trigger assembly
	169 231	Grease, silicone (1)
	193 347	Torch, replacement 25ft (1)
	193 348	Torch, replacement 50ft (1)

Figure 22-16. Torch, ICE-55C

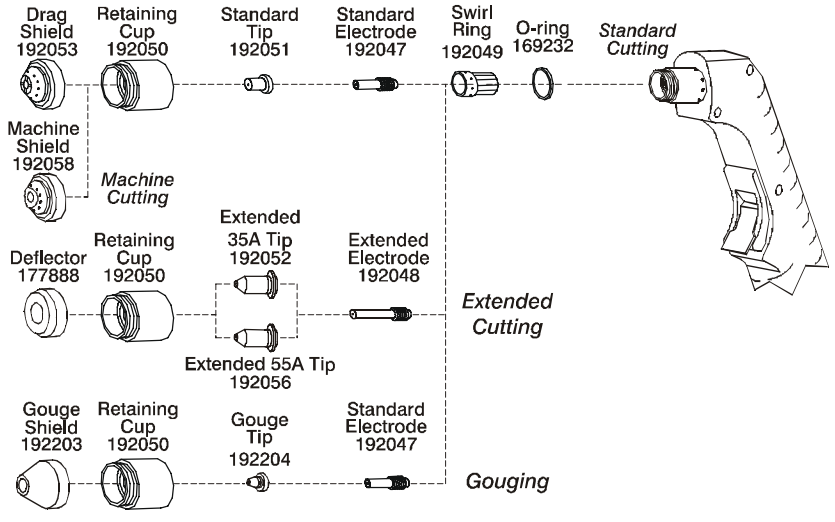
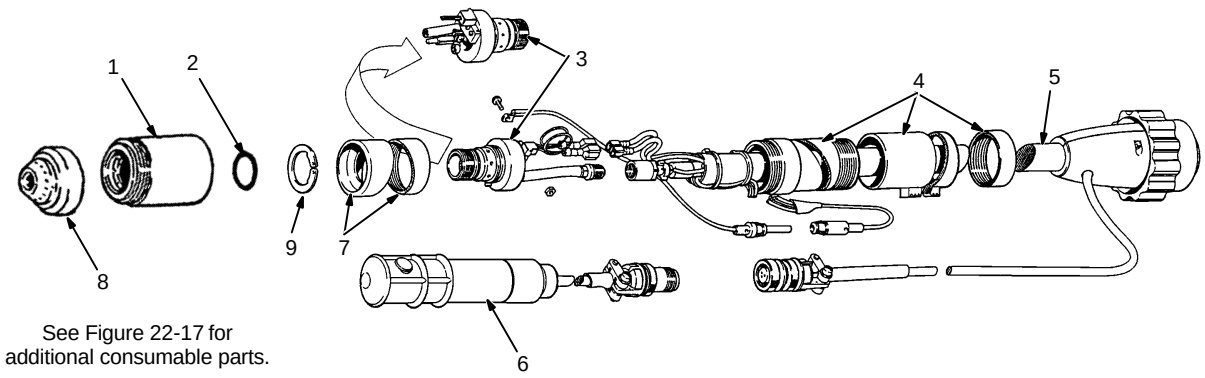


Figure 22-17. Consumable Parts For ICE-55C And 55CM

Item No.	Part No.	Description
1	192 050	Cup, shield (1)
2	169 232	O-Ring, 55A (1)
3	192 060	Main Body (1)
4	180 610	Position Sleeve (1)
5	192 061	Leads, 50ft (1)
6	180 605	Remote Pendent Control (1)
7	198 643	Torch Sleeve (1)
8	192 058	Shield, machine (1)
9	198 644	Ring, retaining (1)
	169 231	Grease, silicone (1)
	193 349	Torch, replacement 50ft (1)

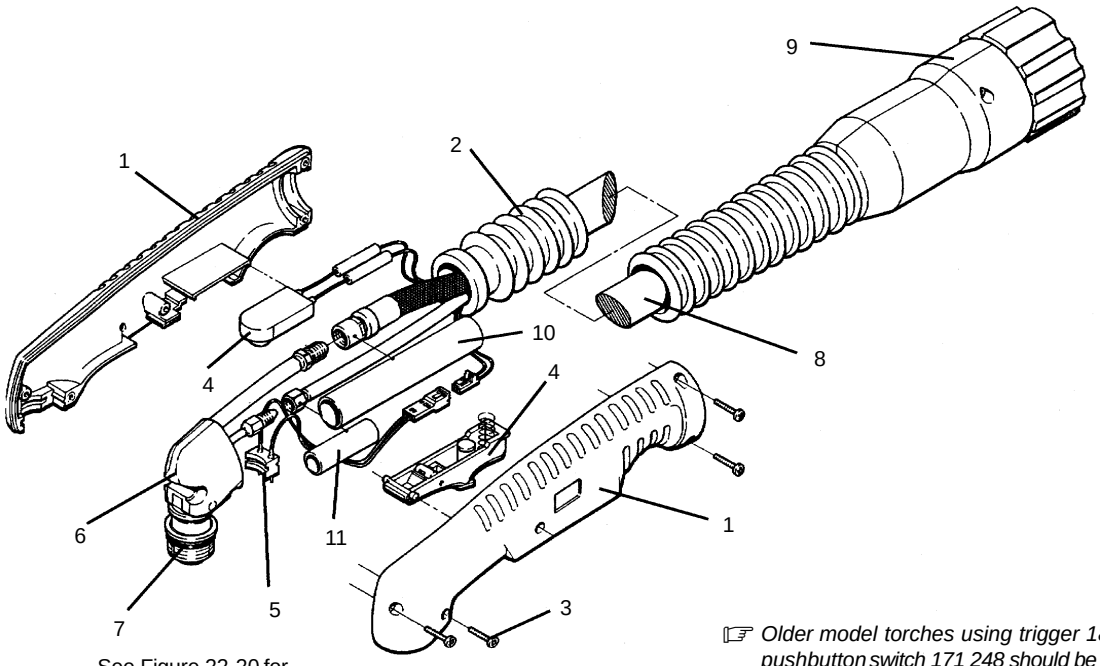


See Figure 22-17 for additional consumable parts.

Figure 22-18. Torch, ICE-55CM

Item No.	Part No.	Description
1	187 300	Handle (1)
2	190 502	Boot (1)
3	190 503	#6 x 5/8 Philips Screw, pan head (5)
4	196 682	Trigger and Switch Replacement Kit (1)
	190 504	spring (1)
5	187 301	Switch, cup sensor (1)
6	187 298	Main Body (1)
7	177 902	O-Ring, silicon .864 x .070 (1)

Item No.	Part No.	Description
8	196 415	Torch Lead, 25ft (1)
8	196 416	Torch Lead, 50ft (1)
9	190 497	Plug Assy, quick disconnect (1)
	187 305	O-Ring, quick disconnect (1)
10	190 500	Tubing, 5/8 in ID (4in) (1)
11	190 501	Heatshrink 1/2 in ID (2.5in) (1)
	176 830	Torch, replacement 25ft (1)
	176 832	Torch, replacement 50ft (1)



See Figure 22-20 for additional consumable parts.

☞ *Older model torches using trigger 187 302 and pushbutton switch 171 248 should be updated using trigger and switch replacement kit 196 682.*

Figure 22-19. Torch, ICE-80C

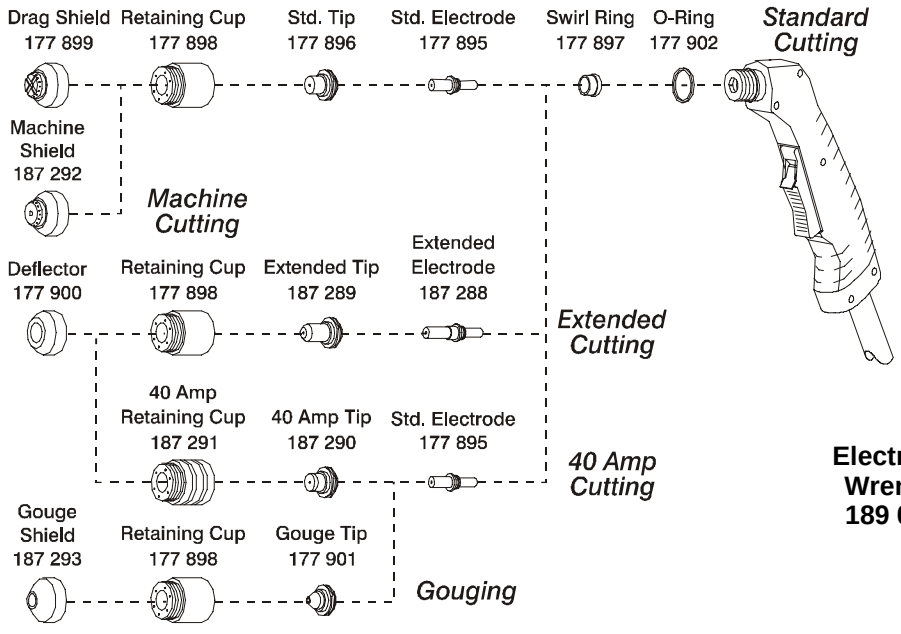


Figure 22-20. Consumable Parts For ICE-80C And 80CM

Item No.	Part No.	Description
1	180 610	Sleeve, torch position (1)
2	196 417	Torch Lead, 50ft (1)
3	190 497	Plug Assy, quick disconnect (1)
	187 305	O-Ring, quick disconnect (1)
4	190 498	Plug, 3-socket female (1)
5	187 299	Main Body (1)
6	177 902	O-Ring, silicon .864 x .070 (1)
7	190 499	Contact, cap-on sensor (2)
8	190 500	Tubing, 5/8 in ID (4in) (1)
9	190 501	Heatshrink 1/2 in ID (2.5in) (1)
	176 834	Torch, replacement 50ft (1)

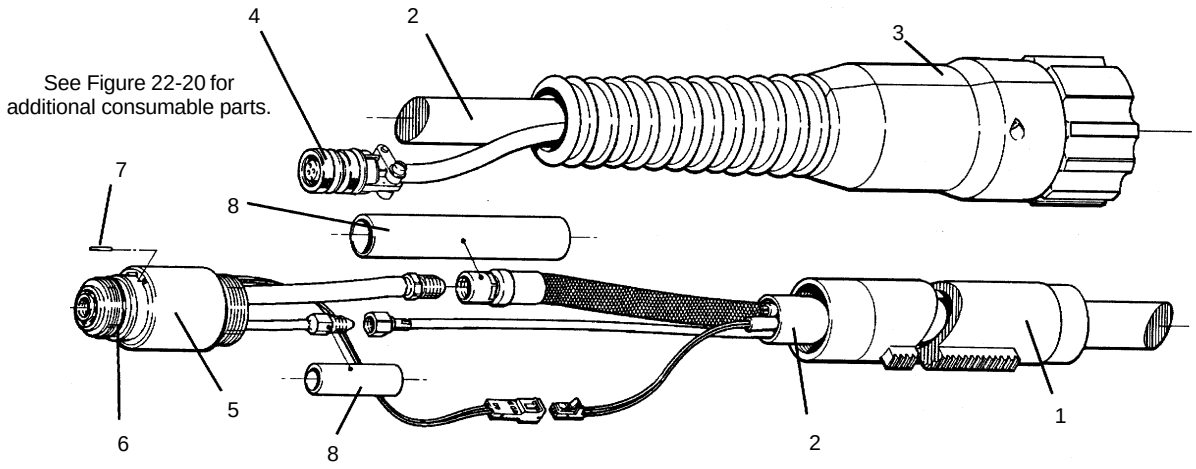
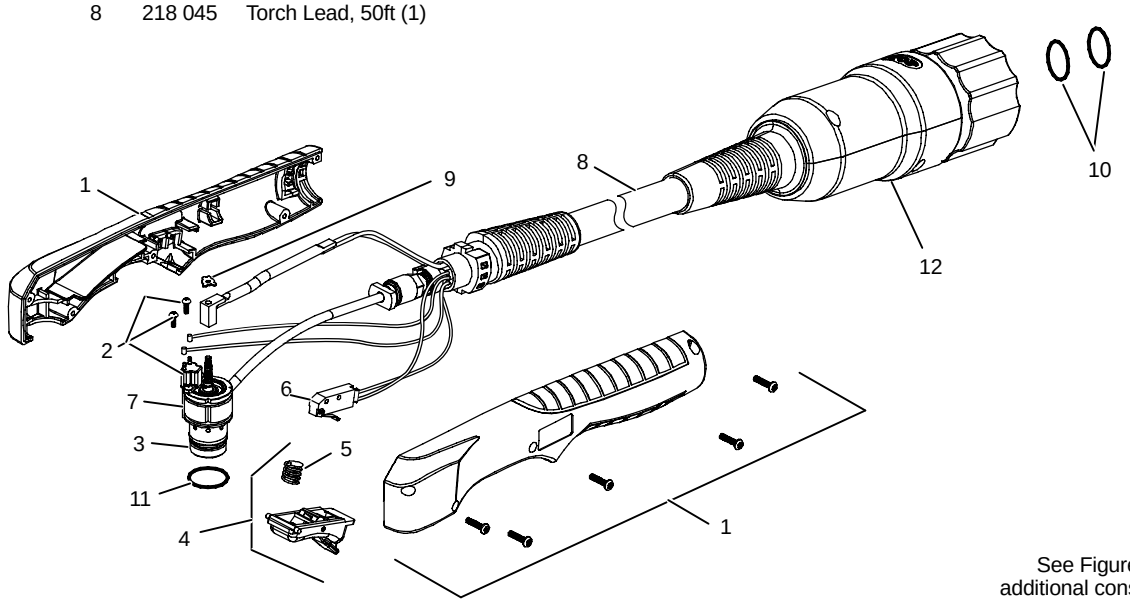


Figure 22-21. Torch, ICE-80CM

Item No.	Part No.	Description
1	215 594	Handle w/Screws (1)
2	215 478	Cup Switch Sensor Kit (1)
3	215 479	Torch Head Repair Kit (1)
4	185 833	Switch Assy w/Spring (1)
5	190 220	Trigger Spring (1)
6	215 592	Switch Trigger (1)
7	215 477	Main Body (1)
8	216 309	Torch Lead, 25ft (1)
8	218 045	Torch Lead, 50ft (1)

Item No.	Part No.	Description
9	215 606	Clip, retaining (1)
10	187 305	O-Ring, quick disconnect (2)
11	212 735	O-Ring, main body (1)
12	218 177	Plug Assy, quick disconnect (1)
	169 231	Grease, silicon
	216 300	Torch, replacement 25ft (1)
	218 044	Torch, replacement 50ft (1)



See Figure 22-23 for additional consumable parts.

Figure 22-22. Torch, ICE-80CX

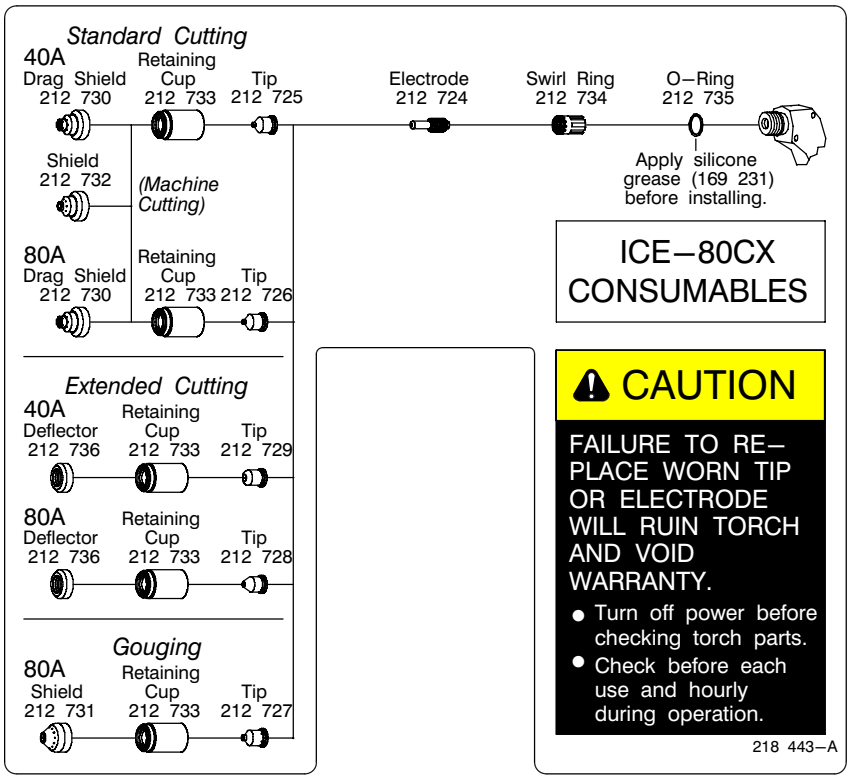
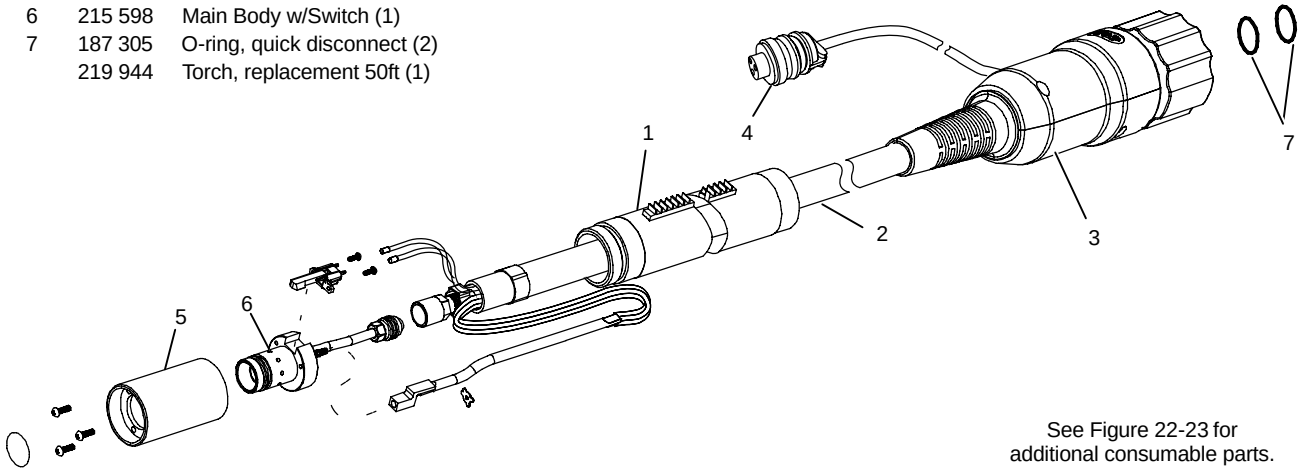


Figure 22-23. Consumable Parts For ICE-80CX

Item No.	Part No.	Description
1	215 607	Sleeve, torch position (1)
2	219 964	Torch Lead, 50ft (1)
3	218 177	Plug Assy, quick disconnect (1)
4	190 498	Plug, 3 socket female (1)
5	215 599	Torch Sleeve (1)
6	215 598	Main Body w/Switch (1)
7	187 305	O-ring, quick disconnect (2)
	219 944	Torch, replacement 50ft (1)

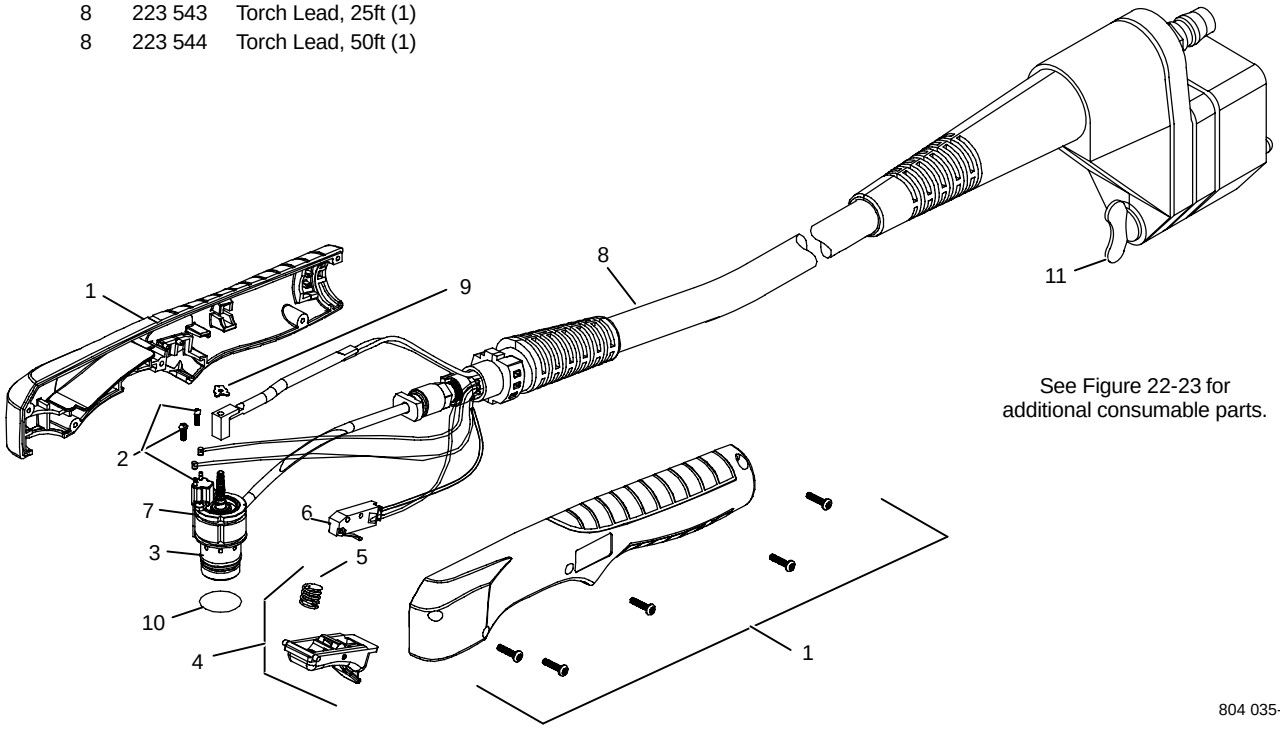


See Figure 22-23 for additional consumable parts.

Figure 22-24. Torch, ICE-80CXM

Item No.	Part No.	Description
1	215 594	Handle w/Screws (1)
2	215 478	Cup Switch Sensor Kit (1)
3	215 479	Torch Head Repair Kit (1)
4	185 833	Switch Assy w/Spring (1)
5	190 220	Trigger Spring (1)
6	215 592	Switch Trigger (1)
7	215 477	Main Body (1)
8	223 543	Torch Lead, 25ft (1)
8	223 544	Torch Lead, 50ft (1)

Item No.	Part No.	Description
9	215 606	Clip, retaining (1)
10	212 735	O-Ring, main body (1)
	169 231	Grease, silicon
	195 223	Torch, replacement 25ft (1)
	195 225	Torch, replacement 50ft (1)
11	227 546	Wing Head 1/4 Turn Fastener (1)



See Figure 22-23 for additional consumable parts.

804 035-A

Figure 22-25. Torch, ICE-80T

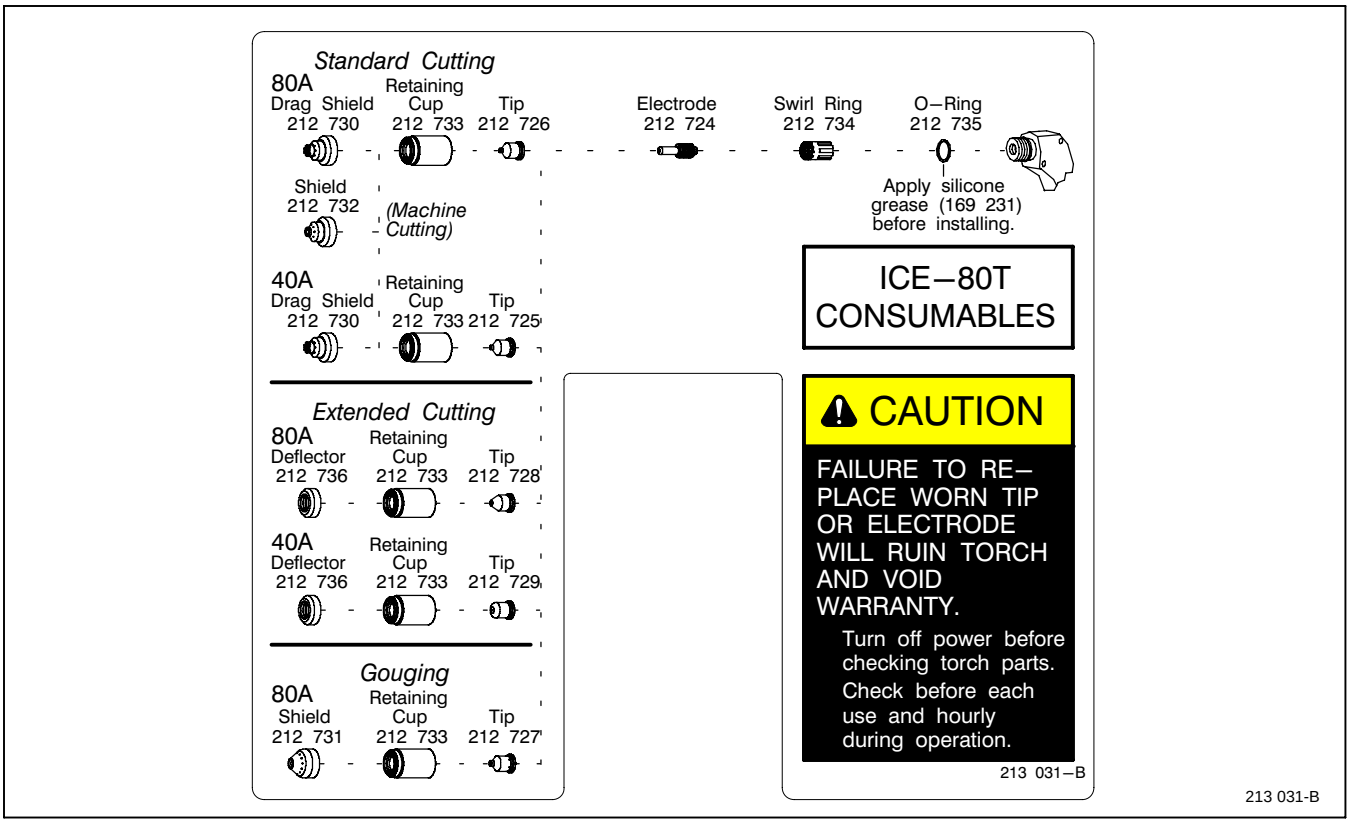


Figure 22-26. Consumable Parts For ICE-80T

Item No.	Part No.	Description
1	215 607	Sleeve, torch position (1)
2	223 545	Torch Lead, 25ft (1)
2	223 546	Torch Lead, 50ft (1)
3	215 599	Torch Sleeve (1)
4	215 598	Main Body (1)
5	195 513	Remote Pendant Control (1)
	195 221	Torch, replacement 25ft (1)
	223 535	Torch, replacement 50ft (1)
	220 240	Cable, remote control trigger 25ft (1)
	220 241	Cable, remote voltage sense 26.5ft (1)
6	227 546	Wing Head 1/4 Turn Fastener (1)
7	215 478	Cup Switch Sensor Kit (1)

See Figure 22-23 for additional consumable parts.

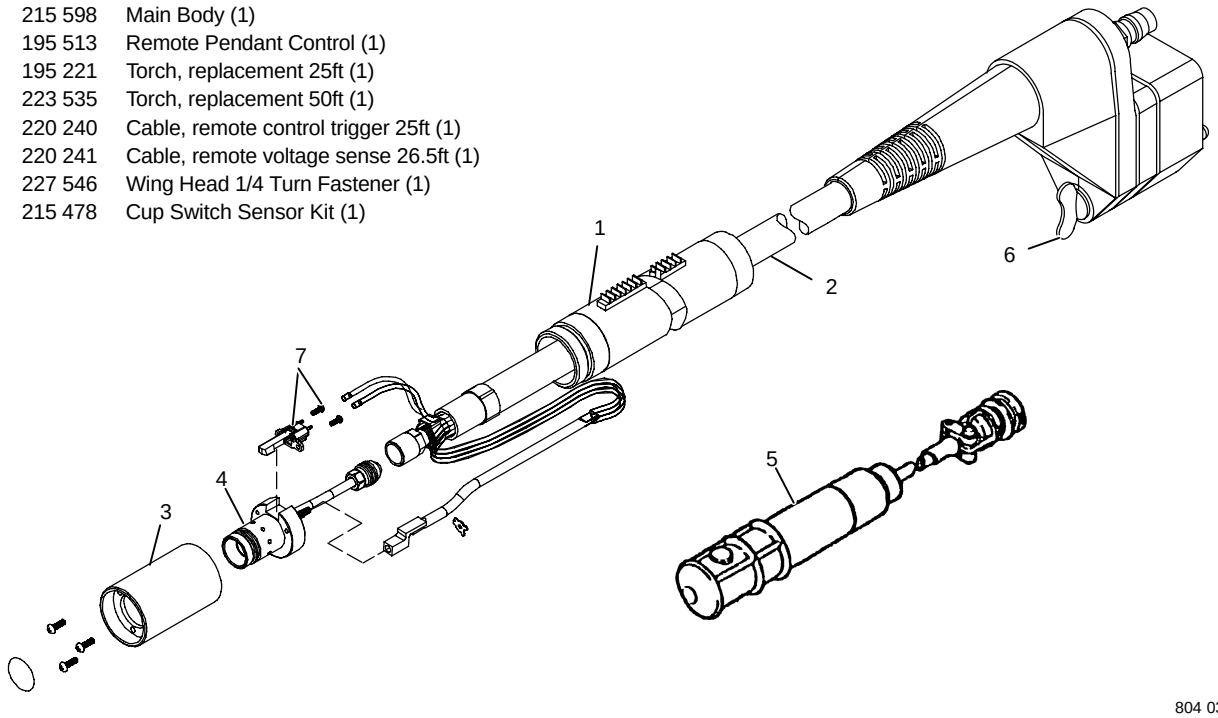
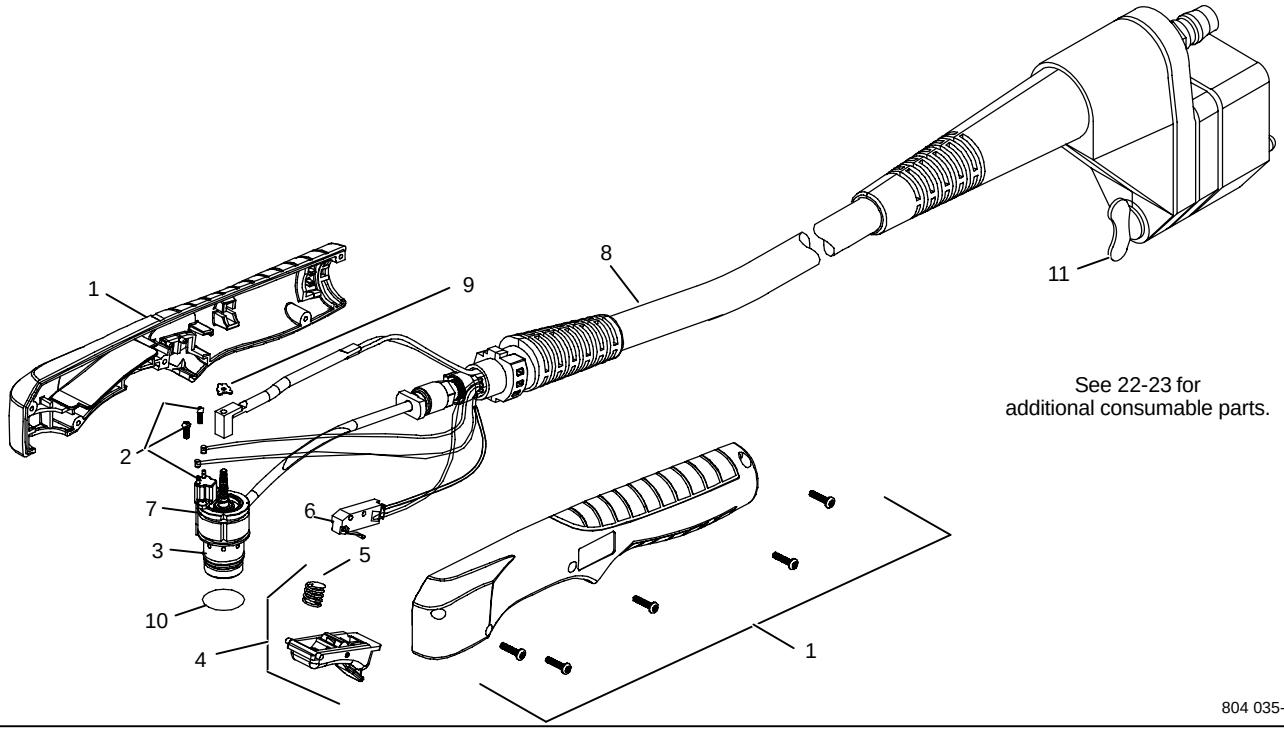


Figure 22-27. Torch, ICE-80TM

Item No.	Part No.	Description
1	215 594	Handle w/Screws (1)
2	215 478	Cup Switch Sensor Kit (1)
3	223 775	Torch Head Repair Kit (1)
4	185 833	Switch Assy w/Spring (1)
5	190 220	Trigger Spring (1)
6	215 592	Switch Trigger (1)
7	223 774	Main Body (1)
8	223 612	Torch Lead, 25ft (1)
8	223 613	Torch Lead, 50ft (1)

Item No.	Part No.	Description
9	215 606	Clip, retaining (1)
10	212 735	O-Ring, main body (1)
	169 231	Grease, silicon
	225 702	Torch, replacement 25ft (1)
	225 704	Torch, replacement 50ft (1)
11	227 546	Wing Head 1/4 Turn Fastener (1)



See 22-23 for additional consumable parts.

Figure 22-28. Torch, ICE-100T

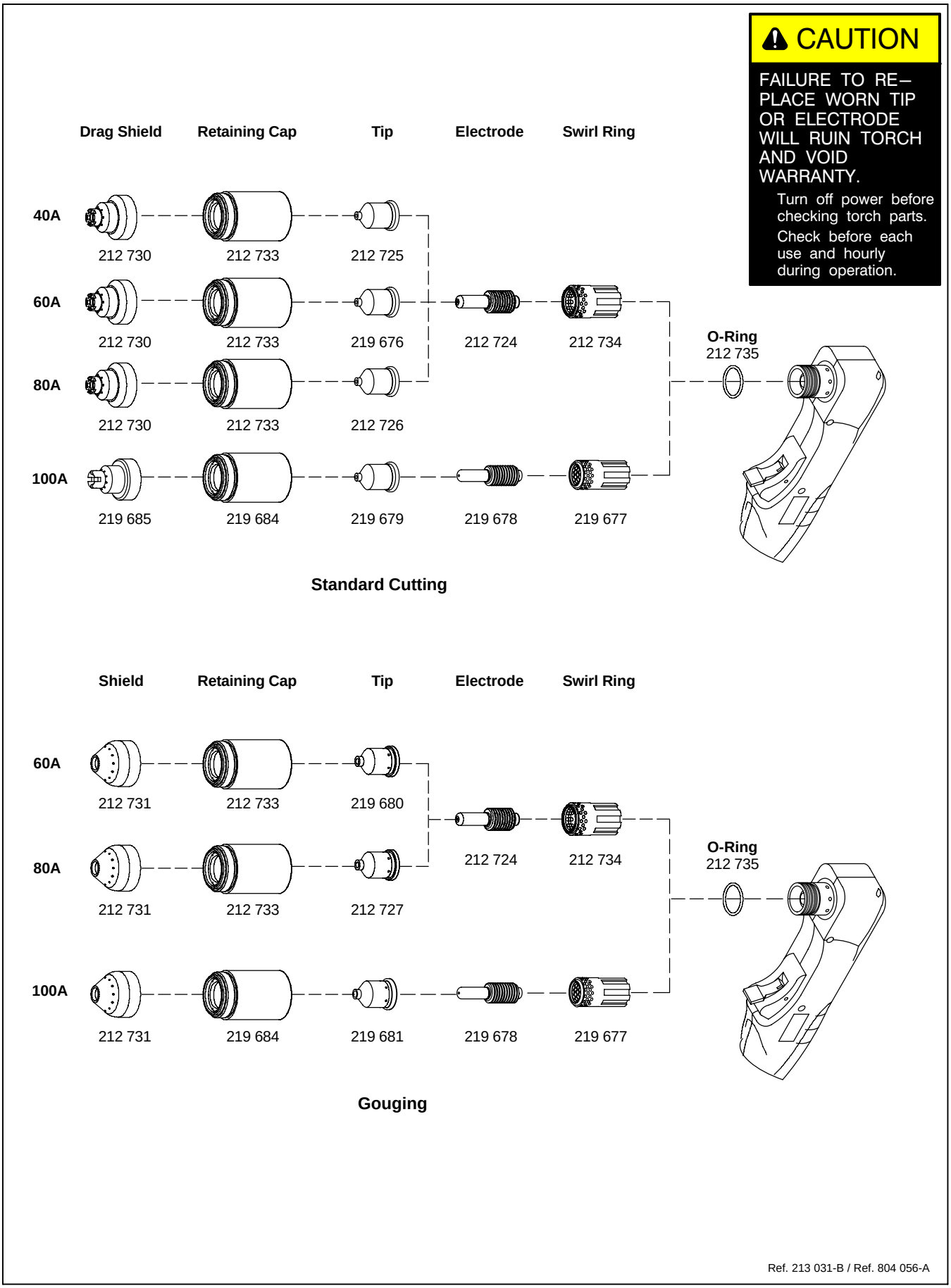
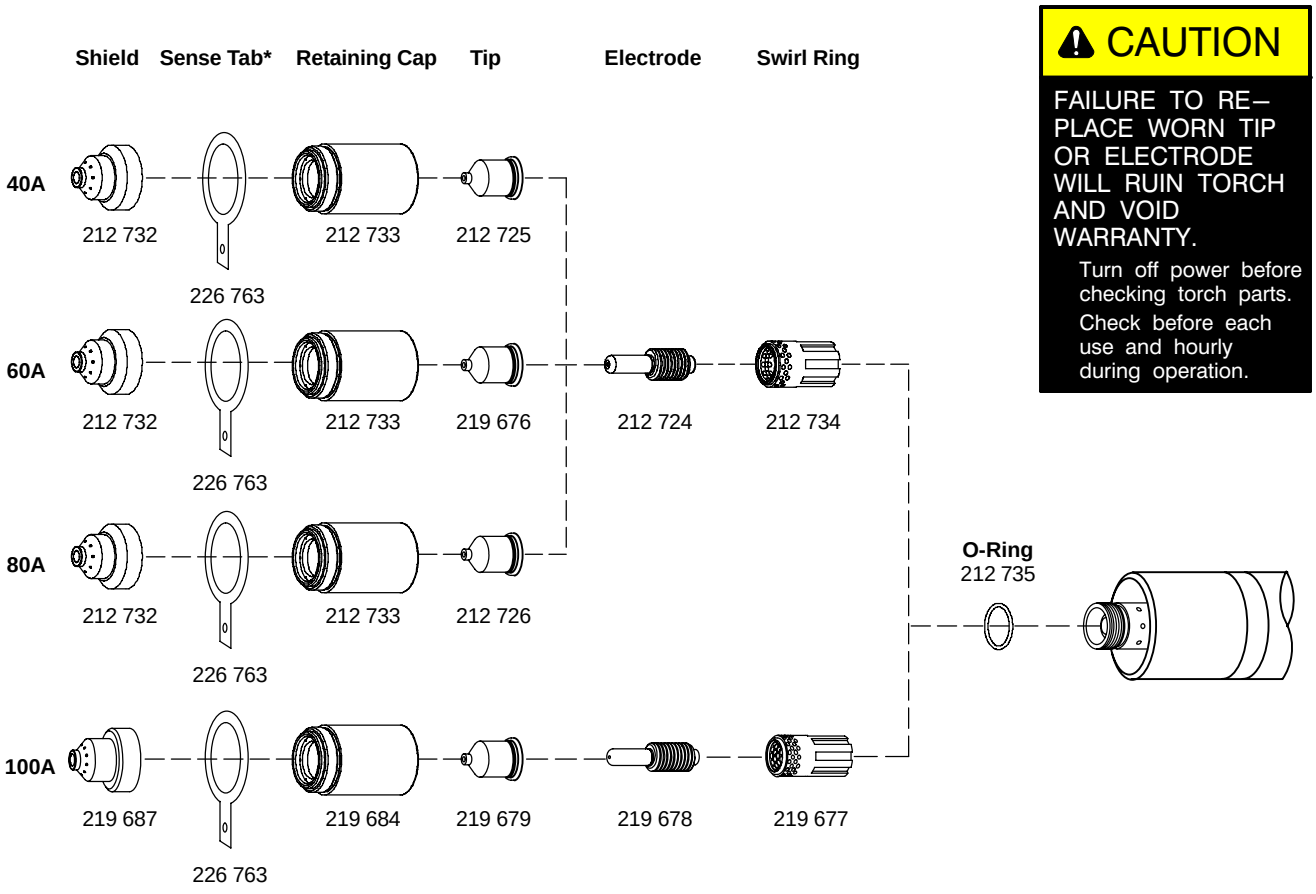
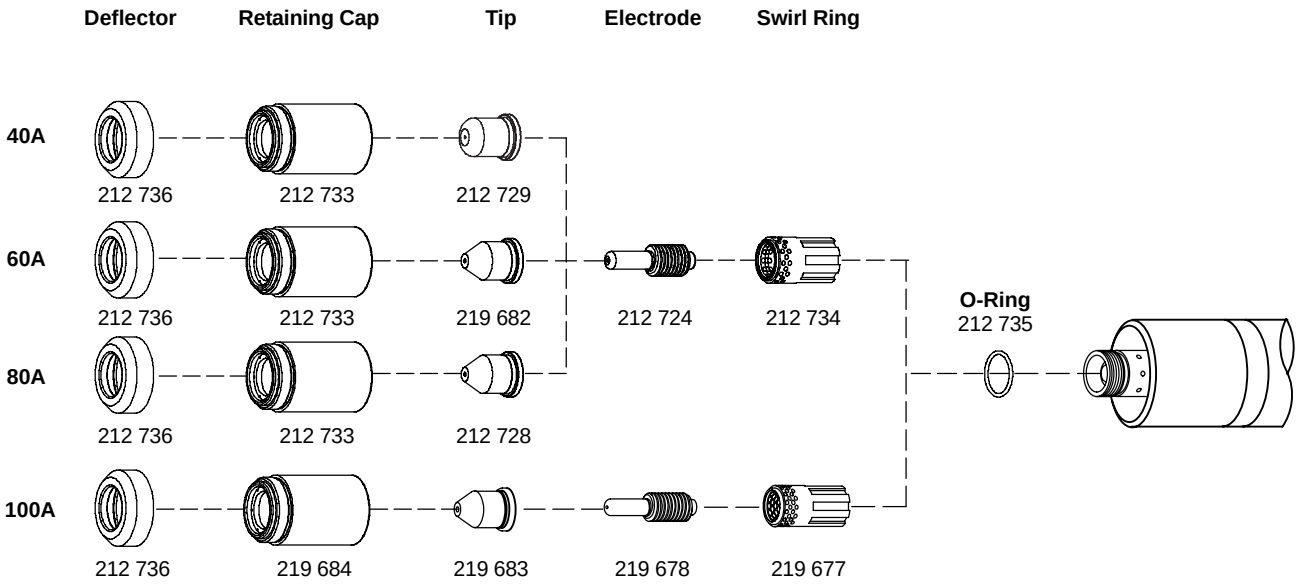


Figure 22-29. Consumable Parts For ICE-100T



Machine Cutting

*Shield sense tab 226 763 provides feedback to a compatible torch height controller before starting the cutting process.



Extended Cutting

Ref. 213 031-B / Ref. 804 056-A

Figure 22-30. Consumable Parts For ICE-100TM

Item No.	Part No.	Description
1	215 607	Sleeve, torch position (1)
2	223 614	Torch Lead, 25ft (1)
2	223 615	Torch Lead, 50ft (1)
3	215 599	Torch Sleeve (1)
4	223 773	Main Body (1)
5	195 513	Remote Pendant Control (1)
6	215 478	Sup Sensor Switch Kit (1)
	225 706	Torch, replacement 25ft (1)
	225 708	Torch, replacement 50ft (1)
	220 240	Cable, remote control trigger 25ft (1)
	220 241	Cable, remote voltage sense 26.5ft (1)
7	227 546	Wing Head 1/4 Turn Fastener (1)

☞ *See 22-30 for additional consumable parts.*

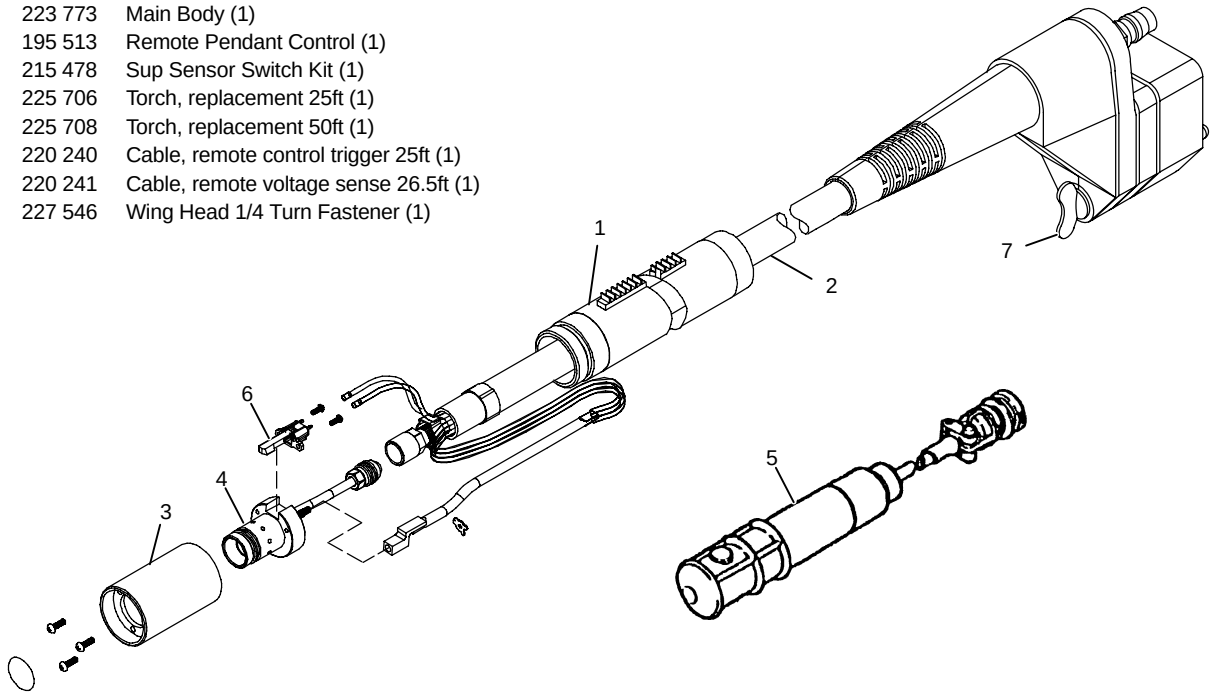


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Figure 22-31. Torch, ICE-100TM